1995

# YÖS

YABANCI ÖĞRENCİ SINAVLARI
FOREIGN STUDENT EXAMINATIONS

## GEOMETRİ
## GEOMETRY

y a

## ÇÖZÜMLÜ SORU BANKASI
## QUESTION BANK WITH SOLUTIONS

**78** Çözümlü Test
Tests with Solutions

**48** Konu Testi
Subject Tests

**1509** Toplam Soru
Total Questions

**5** Deneme Sınavı
Trial Exams

Türkiye'de ve Dünyada!
In Turkey and Around the World!

METROPOL YAYINLARI

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# ÖNSÖZ

**Değerli öğrenciler,**

Metropol Eğitim Kurumları, 1995'den bugüne üniversite giriş sınavlarına hazırlanan öğrencilere kurs, yayın ve rehberlik hizmetleri sunan, Türkiye'de ve Dünyanın farklı ülkelerinde şube ve temsilcilikleri bulunan uluslararası bir eğitim kurumları zinciridir.

Kurumlarımız, Türkiye üniversitelerinin gerçekleştirdikleri Yurtdışından Öğrenci Kabul Sınavları ya da bilinen adıyla Yabancı Uyruklu Öğrenci Sınavlarına (YÖS) hazırlanan ve bu üniversitelerde yüksek öğrenim görmeyi hedefleyen yabancı uyruklu ve T.C. vatandaşı öğrencilere kurs, yayın ve danışmalık hizmetleri vermektedirler.

Türkiye'nin önde gelen üniversitelerinin düzenledikleri bu sınavlarda (YÖS), Temel Öğrenme Becerileri Testi ve Türkçe Yeterlilik Testi olmak üzere iki ayrı test yer almaktadır. Sınavlardaki Türkçe testleri, sınava katılan öğrencilerin Türkçe dil yeterliliklerini ölçmek için uygulanmakta olup, yerleştirme puanlarını etkilememektedir. Temel Öğrenme Becerileri Testleri ise sınavların değerlendirmelerinde ve üniversitelere kabul aşamalarında dikkate alınmakta ve yerleştirmeler bu testlerin sonuçlarına göre yapılmaktadır.

Bu nedenle, sınavlarda başarılı olabilmek için öncelikle Temel Öğrenme Becerileri Testlerinde baraj olarak belirlenen puanları aşmanız ve hedeflediğiniz puanlara ulaşmanız gerekmektedir.

Sınavlardaki Temel Öğrenme Becerileri Testlerinde Genel Yetenek (IQ), Matematik ve Geometri soruları yer almakta olup; bu testlerin ortalama olarak % 40'ının Matematik sorularından oluştuğu dikkate alındığında, bu soruları doğru yanıtlamanız sınavların başarı sıralamalarında öne çıkmanızı sağlayacaktır.

Türkiye'nin seçkin üniversitelerinde öğrenim görebilme şansını yakalayabilmek için YÖS hazırlık kurslarımıza katılmanızı ve yayınlarımızı hazırlamış olan, alanında uzman ve deneyimli öğretmenlerimizden destek almanızı öneririz.

Tüm YÖS adaylarına başarılar dileriz!

# PREFACE

**Dear students,**

Metropol Educational Institutions are a group of international educational institutions since 1995 which have been offering services such as training, publications and consultancy to students who are studying for the university entrance exam and which have branches and representations in Turkey and different countries in the world.

Our Institutions provide courses, publications and consultancy services to foreign and Turkish students who are preparing for the Foreign Students Acceptance Exams alias Foreign Students Exams (YÖS) which are held by the universities in Turkey.

In these exams (YÖS) held by the renowned universities in Turkey, there are two separate tests; Basic Learning Skills Test and Turkish Language Test. The Turkish Language Tests applied in the exams are intended to measure the Turkish language skills of the students who enter the exam and it does not effect on the placement score. The Basic Learning Skills Test is taken into consideration in the evaluation processes of the exams and in the acceptance processes by the universities; the placements are performed according to the results of these tests.

Therefore, in order to be successful in the exams, first of all you need to get higher scores than the base point determined for the Basic Learning Skills Test and reach the scores that you have targeted.

The Basic Learning Skills Tests include Intelligent Quotient (IQ), Mathematics and Geometry questions; considering that Mathematics comprises of the 40% of the questions averagely, giving the correct answers to these questions enables you to come to the forefront in the success ratings of these tests.

We suggest that you participate in YÖS preparation courses and obtain support from expert and experienced teachers who prepare the publications in order to have the chance to receive education in the respected universities of Turkey.

We wish luck to all YÖS candidates!

**METROPOL EĞİTİM KURUMLARI**
**METROPOL EDUCATIONAL INSTITUTIONS**

# VORWORT

**Liebe Schülerinnen und Schüler,**

Die Metropol Bildungsinstitution ist eine internationale Kette, die seit 1995 mit Dienstleistungen wie Schulungen, Publikationen und Beratungen Schüler/ -innen auf die Studienberechtigungsprüfung vorbereitet und sowohl in der Türkei als auch in verschiedenen Ländern der Welt Niederlassungen und Vertretungen besitzt.

Unsere İnstitutionen unterstützen Schüler/ -innen türkischer und ausländischer Staatsbürgerschaft, die sich auf die Prüfungen zur Aufnahme von ausländischen Schülern/ -innen alias Prüfung für auslandsstämmige Schüler/ -innen (YÖS), die von den Universitäten in der Türkei veranstaltet werden, vorbereiten und an diesen Universitäten studieren möchten.

Die von renommierten Universitäten angebotene Prüfung (YÖS) ist in zwei Bereichen erfolgreich zu bestehen. Der erste Teil betrifft die Fähigkeit Grundlagenkenntnisse zu erwerben, wobei der zweite Teil die Sprachkenntnisse im Türkischen prüft.

Mit Hilfe dieser Eignungstests werden die türkischen Sprachkenntnisse der Schüler/ -innen ermittelt, dabei haben sie keinen Einfluss auf die Platzierungspunkte. Ausschlaggebend für die Platzierung der Bewerber/innen an den Universitäten ist der Grundlernfähigkeitstest, bei dem die allgemeine Mindestpunktzahl der Prüfung und die erforderliche Punktzahl des erstrebten Studienfachs zu erreichen ist.

Dieser Test beinhaltet Fragen zur allgemeinen Fähigkeit (IQ), Mathematik und Geometrie. In Anbetracht der Tatsache, dass der Mathematik 40% der Prüfung darstellt, ist es für Sie von Vorteil den Fokus auf diesen Bereich zu legen, um unter die Besten zu kommen.

Um an den renommierten Hoschulen der Türkei studieren zu können, empfehlen wir Ihnen, an unseren YÖS-Vorbereitungskursen teilzunehmen und sich von unseren kompetenten und erfahrenen Lehrkräften , die die Publikationen vorbereitet haben, untersützen zu lassen.

Wir wünschen allen YÖS Kandidaten viel Erfolg!

# ВСТУПЛЕНИЕ

**Уважаемые студенты!**

Образовательные учреждения Metropol – это международная сеть учебных заведений, которая с 1995 года по сегодняшний день предоставляет для студентов, готовящихся к вступительным экзаменам в университет, поддержку в виде курсов, публикаций и консультаций. Образовательные учреждения Metropol имеют филиалы и представительства в Турции и в разных странах мира.

Наши учреждения оказывают поддержку иностранным и турецким студентам, которые нацелены получить высшее образование в университетах Турции и готовятся к сдаче вступительных экзаменов для иностранных студентов, известных как экзамены для иностранных студентов YÖS, проводящихся данными университетами.

Экзамены YÖS организуются ведущими университетами Турции и состоят из двух отдельных частей: теста "Основные навыки обучения" и экзамена на знание турецкого языка. Тест на знание турецкого языка включен в экзамен для определения уровня владения турецким языком студентов, сдающих экзамен, и на распределение результатов не влияет. Распределение осуществляется на основании результатов теста "Основные навыки обучения", который принимается во внимание при оценке экзамена и на этапе приёма в университет.

Поэтому, для того, чтобы успешно сдать экзамены, прежде всего, Вы должны получить более высокий балл, чем граничный балл, определенный для теста "Основные навыки обучения", и достичь запланированной оценки.

Экзаменационный тест "Основные навыки обучения" содержит вопросы на уровень интеллекта (IQ), вопросы по математике и геометрии. Учитывая, что **40%** вопросов теста составляют вопросы на уровень интеллекта (IQ), правильно

Для того, чтобы иметь возможность получить образование в элитных вузах Турции, мы предлагаем вам принять участие в подготовительных курсах YÖS и получить поддержку наших опытных преподавателей, которые являются специалистами в своей области и готовят наши публикации.

Мы желаем успехов всем кандидатам, готовящимся к экзамену **YÖS!**

**METROPOL BILDUNGSINSTITUTIONEN**

**ОБРАЗОВАТЕЛЬНЫЕ УЧРЕЖДЕНИЯ METROPOL**

# İçindekiler / Contents

# İçindekiler / Contents

# BÖLÜM CHAPTER 1

## TARİHSEL NOT / HISTORICAL NOTE

### CAHİT ARF [1910 – 1997]

Türk matematikçi ve bilim insanı. TÜBİTAK Bilim Kolu eski başkanı. Cebir konusundaki çalışmalarıyla dünyaca ün kazanmıştır. Cisimlerin kuadratik formlarının sınıflandırılmasında ortaya çıkan değişmezlere ilişkin ARF değişmezi ve ARF halkaları gibi literatürde adıyla anılan çalışmaların yanı sıra "Hasse-ARF Teoremi" adı ile anılan teoremi matematik bilimine kazandırmıştır. Cahit ARF, matematiği bir meslek dalı olarak değil, bir yaşam tarzı olarak görmüştür. Öğrencilerine sürekli: "Matematiği ezberlemeyin, kendiniz yapın ve anlayın." demiştir.

Turkish mathematician and scientist. Former chairman of the TUBITAK Science Branch. His work on algebra has gained worldwide fame. In addition to the studies in the literature such as the Arf invariant and Arf rings related to the invariants that emerged in the classification of quadratic forms of the objects, he introduced the theorem called "Hasse-Arf Theorem" to mathematical science. Cahit Arf saw mathematics as a lifestyle rather than a profession. He constantly told his students: "Do not memorize the math, do it yourself and understand it."

# GEOMETRİK KAVRAMLAR ve AÇILAR
# GEOMETRICAL CONCEPTS and ANGLES

**Bu bölüm 36 çözümlü test sorusu ve 24 test sorusu içermektedir.**

This chapter includes 36 test questions with solutions and 24 test questions.

**BÖLÜM / CHAPTER 1**

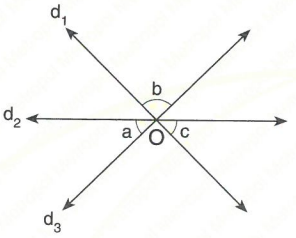
## GEOMETRİK KAVRAMLAR VE AÇILAR / GEOMETRICAL CONCEPTS and ANGLES

BÖLÜM 01 CHAPTER

# GEOMETRİK KAVRAMLAR ve AÇILAR
# GEOMETRICAL CONCEPTS and ANGLES

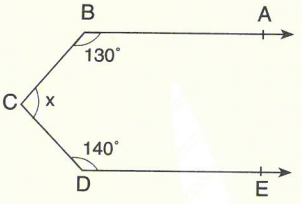


**1.** $d_1 \cap d_2 \cap d_3 = \{O\}$,
$3a + 4b + 3c = 600°$
$\Rightarrow$ **b = ?**



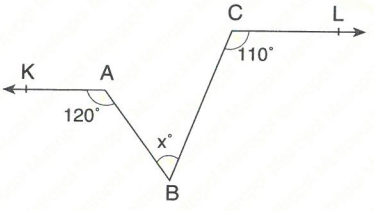

A) 20° B) 40° C) 60° D) 80° E) 100°

**2.** [BA // [DE
$\Rightarrow$ **m($\widehat{BCD}$) = x = ?**




A) 60° B) 75° C) 90° D) 105° E) 120°

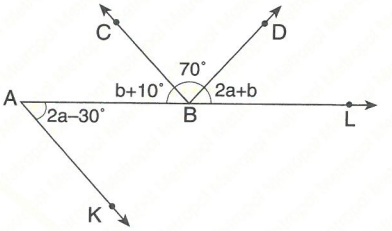
**3.**




[AK // [CL $\Rightarrow$ **m($\widehat{ABC}$) = x = ?**

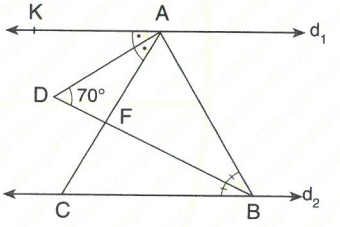
A) 50° B) 55° C) 60° D) 65° E) 70°

**4.** [BC // [AK
$\Rightarrow$ **b = ?**



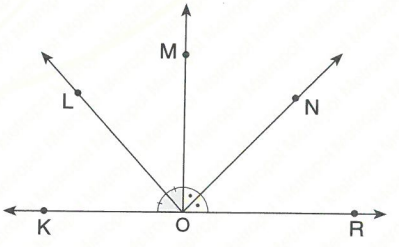

A) 10° B) 20° C) 30° D) 40° E) 50°

**5.** $d_1 \parallel d_2$,
$m(\widehat{KAD}) = m(\widehat{DAF})$,
$m(\widehat{ABF}) = m(\widehat{FBC})$,
$m(\widehat{ADF}) = 70°$
$\Rightarrow$ **m($\widehat{FAB}$) = ?**




A) 40° B) 50° C) 60° D) 70° E) 80°

**6.**




$m(\widehat{KOL}) = m(\widehat{LOM})$, $m(\widehat{MON}) = m(\widehat{NOR})$,
$m(\widehat{LOR}) = 135° \Rightarrow$ **m($\widehat{NOR}$) = ?**

A) 90° B) 75° C) 60° D) 45° E) 30°

**7.** [BF // [CE,

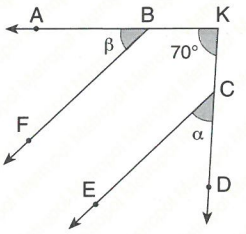
$m(\widehat{BKC}) = 70°$,

$m(\widehat{ABF}) = \beta$,

$m(\widehat{ECD}) = \alpha$,

$\alpha - \beta = 10°$

$\Rightarrow$ **$m(\widehat{ECD}) = \alpha = ?$**




A) 60° B) 55° C) 50° D) 40° E) 30°

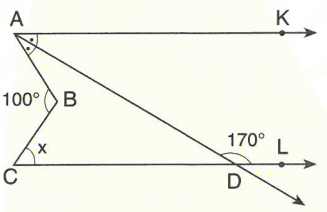
**8.** [AK // [CL,

$(\widehat{KAD}) = m(\widehat{DAB})$,

$m(\widehat{ADL}) = 170°$,

$m(\widehat{ABC}) = 100°$

$\Rightarrow$ **$m(\widehat{BCD}) = x = ?$**




A) 80° B) 70° C) 60° D) 55° E) 50°

**9.** [AK // [BL,

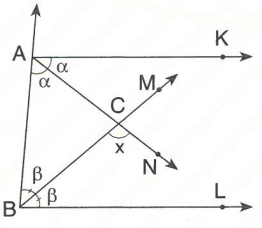
$m(\widehat{KAC}) = m(\widehat{CAB}) = \alpha$,

$m(\widehat{ABC}) = m(\widehat{CBL}) = \beta$,

$m(\widehat{BCN}) = x$,

$x - \alpha = 30°$

$\Rightarrow$ **$\beta = ?$**




A) 10° B) 20° C) 30° D) 40° E) 50°

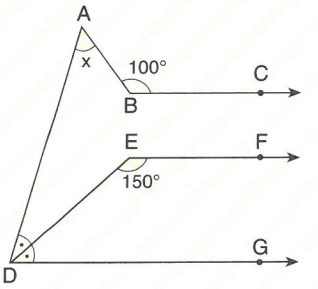
**10.** [BC // [EF // [DG,

$m(\widehat{ABC}) = 100°$,

$m(\widehat{DEF}) = 150°$,

$m(\widehat{ADE}) = m(\widehat{EDG})$

$\Rightarrow$ **$m(\widehat{DAB}) = x = ?$**



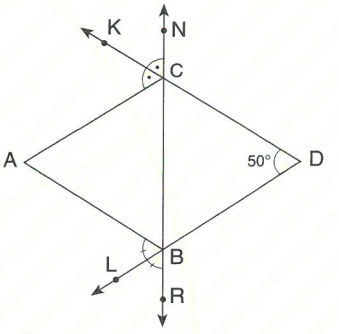

A) 40° B) 50° C) 60° D) 70° E) 80°

**11.** $m(\widehat{ACK}) = m(\widehat{KCN})$,

$m(\widehat{ABL}) = m(\widehat{LBR})$,

$m(\widehat{CDB}) = 50°$

$\Rightarrow$ **$m(\widehat{CAB}) = ?$**



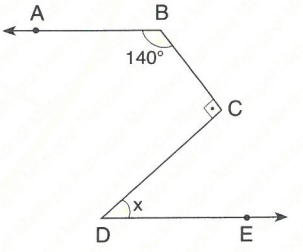

A) 40° B) 50° C) 60° D) 70° E) 80°

**12.** [BA // [DE,

$m(\widehat{ABC}) = 140°$,

$m(\widehat{BCD}) = 90°$

$\Rightarrow$ **$m(\widehat{CDE}) = x = ?$**

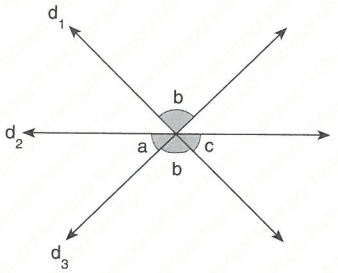



A) 25° B) 35° C) 40° D) 45° E) 50°

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | C | A | B | A | D | D | A | C | A | E | E |

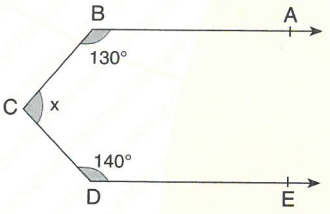
**1.**




$$\begin{aligned} 3a+4b+3c &= 600^\circ \\ -3 \quad a+b+c &= 180^\circ \\ \hline 3a+4b+3c &= 600^\circ \\ +/-3a-3b-3c &= 540^\circ \\ \hline b &= 60^\circ \end{aligned}$$

**Yanıt / Answer C**

**2.**

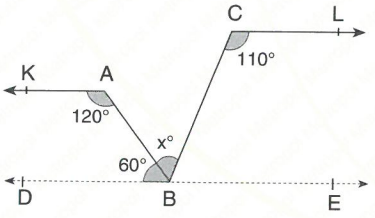



$[BA \,//\, [DE \Rightarrow 130^\circ + x + 140^\circ = 360^\circ$

$x = 90^\circ$

**Yanıt / Answer C**

**3.**

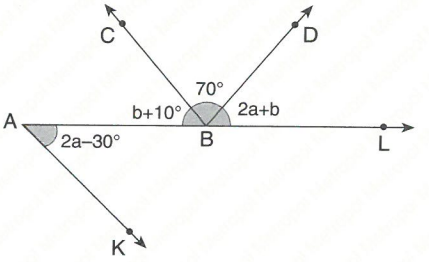



$\left.\begin{array}{l} m(\widehat{ABD}) = 60 \\ [CL \,//\, [DE \end{array}\right\} \Rightarrow x + 60^\circ = 110^\circ$

$x = 50^\circ$

**Yanıt / Answer A**

**4.**




$b + 10^\circ + 70^\circ + 2a + b = 180^\circ$

$2a + 2b = 100^\circ$

$a + b = 50^\circ \Rightarrow b = 50^\circ - a$

$[BC \,//\, [AK \Rightarrow$

$b + 10^\circ = 2a - 30^\circ$

$b = 2a - 40^\circ \ldots$

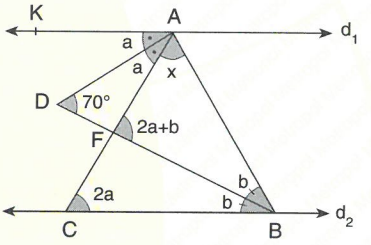
$50^\circ - a = 2a - 40^\circ$

$a = 30^\circ$

$b = 2 \cdot 30^\circ - 40^\circ \Rightarrow b = 20^\circ$

**Yanıt / Answer B**

**5.**




$d_1 \,//\, d_2$

$m(\widehat{KAD}) = a$

$m(\widehat{DBC}) = b$

$m(\widehat{ADB}) = a + b = 70^\circ$

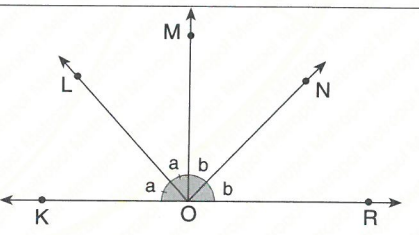
$2a + 2b + x = 180^\circ$

$140 + x = 180^\circ$

$x = 40^\circ$

**Yanıt / Answer A**

**6.**




$m(\widehat{KOL}) = m(\widehat{LOM}) = a$

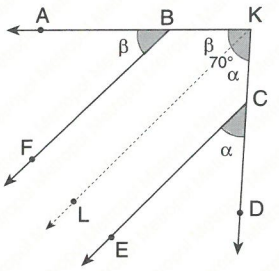
$m(\widehat{KON}) = m(\widehat{NOR}) = b$

$2a + 2b = 180^\circ \Rightarrow a + b = 90^\circ$

$m(\widehat{LOR}) = a + b + b = 135^\circ \Rightarrow b = 45^\circ$

**Yanıt / Answer D**

**7.**




$\alpha - \beta = 10°$

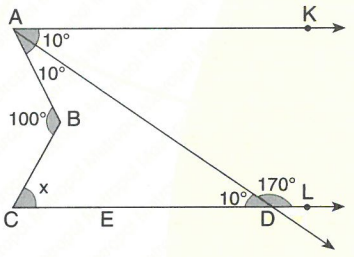
$m(\widehat{ABF}) = m(\widehat{BKL})$

$m(\widehat{ECD}) = m(\widehat{LKD})$

$$\begin{array}{r} \alpha+\beta=70° \\ +\quad \alpha-\beta=10° \\ \hline 2\alpha = 80° \Rightarrow \alpha = 40° \end{array}$$

**Yanıt / Answer D**

**8.**



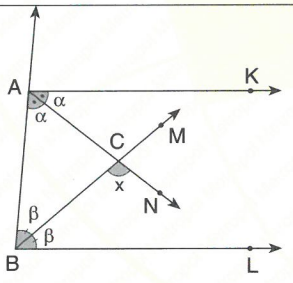

$m(A\widehat{D}L) = 170° \Rightarrow m(A\widehat{D}C) = 10°$

$m(A\widehat{D}C) = 10° \Rightarrow m(K\widehat{A}D) = m(D\widehat{A}B) = 10°$

$x + 20 = 100° \Rightarrow x = 80°$

**Yanıt / Answer A**

**9.**



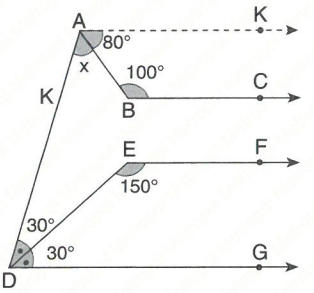

$\alpha + \beta = m(\widehat{ACB}) = 90° \Rightarrow x = 90°$

$x - \alpha = 30 \Rightarrow \alpha + \beta - \alpha = 30°$

$\beta = 30°$

**Yanıt / Answer C**

**10.**




$\left.\begin{array}{l}[EF \parallel [DG \\ m(\widehat{DEF}) = 150°\end{array}\right\} \Rightarrow m(\widehat{EDG}) = m(\widehat{EDA}) = 30°$

$m(A\widehat{B}C) = 100° \Rightarrow m(B\widehat{A}K) = 80°$

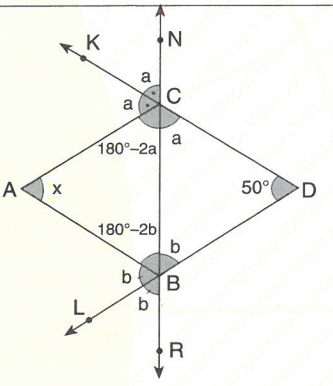
$m(\widehat{ADG}) + m(D\widehat{A}K) = 180°$

$60° + x + 80° = 180°$

$\Rightarrow x = 40°$

**Yanıt / Answer A**

**11.**




$a + b + 50° = 180° \Rightarrow a + b = 130°$

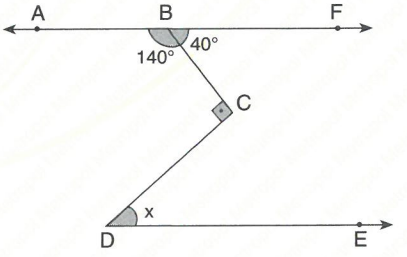
$x + 180° - 2a + 180° - 2b = 180°$

$x = 2\cdot(a + b) - 180°$

$x = 260° - 180° = 80°$

**Yanıt / Answer E**

**12.**



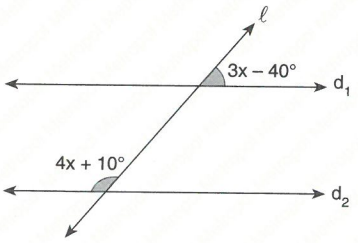

$m(\widehat{ABC}) = 140° \Rightarrow m(\widehat{CBF}) = 40°$

$x + 40° = 90° \Rightarrow x = 50°$

**Yanıt / Answer E**

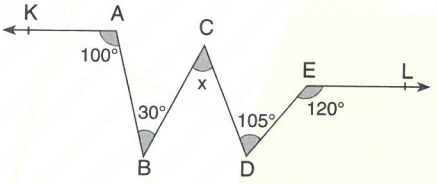
**1.** $d_1 \,//\, d_2$

$\Rightarrow$ **x = ?**




A) 20° B) 30° C) 40° D) 50° E) 60°

**2.**




[AK // [EL $\Rightarrow$ **x = ?**

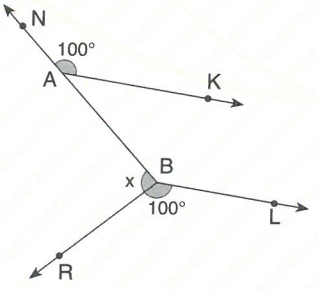
A) 80° B) 90° C) 95° D) 100° E) 105°

**3.** [AK // BL,

$m(\widehat{KAN}) = 100$,

$m(\widehat{LBR}) = 100°$

$\Rightarrow$ **$m(\widehat{ABR}) = x = ?$**




A) 160° B) 150° C) 140° D) 130° E) 120°

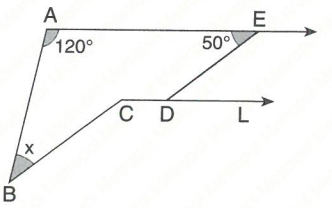
**4.** [AE // [CL,

[BC] // [ED],

$m(\widehat{EAB}) = 120°$,

$m(\widehat{AED}) = 50°$

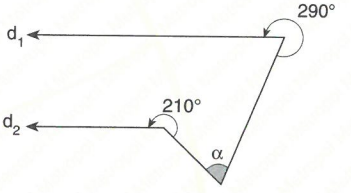
$\Rightarrow$ **$m(\widehat{ABC}) = x = ?$**




A) 10° B) 20° C) 30° D) 40° E) 50°

**5.** $d_1 \,//\, d_2$

$\Rightarrow$ **$\alpha$ = ?**




A) 80° B) 75° C) 65° D) 60° E) 50°

**6.** [AK // [CL,

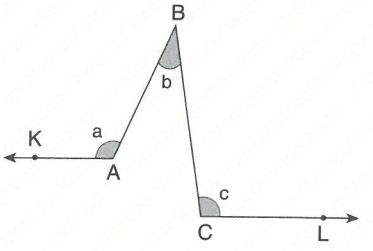
$m(\widehat{KAB}) = a$,

$m(\widehat{ABC}) = b$,

$m(\widehat{BCL}) = c$,

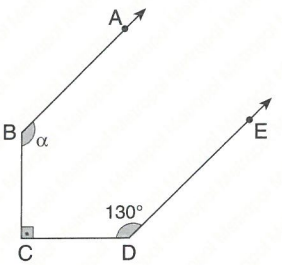
$a - b = 60°$

$\Rightarrow$ **c = ?**



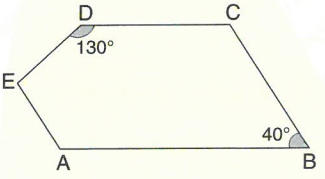

A) 120° B) 100° C) 80° D) 60° E) 40°

**7.** [BA // [DE,
[BC] ⊥ [DE,
m(CDE) = 130°,
⇒ **m(ABC) = α = ?**



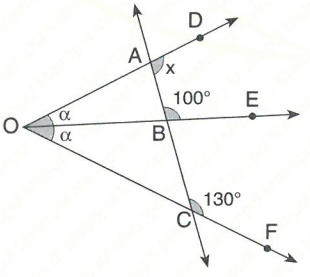

A) 135° B) 140° C) 145° D) 150° E) 160°

**8.** [DC] // [AB],
[AE] // [BC],
m(EDC) = 130°,
m(CBA) = 40°
⇒ **m(DEA) = ?**



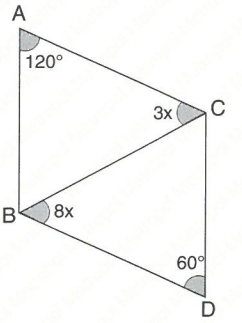

A) 80° B) 90° C) 100° D) 110° E) 120°

**9.** m(AOB) = m(COB) = a,
m(ABE) = 100°
m(ACF) = 130°
⇒ **m(BAD) = x = ?**



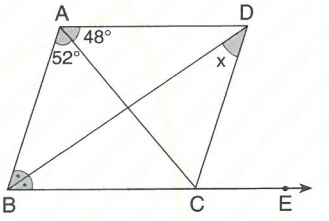

A) 120° B) 115° C) 110° D) 100° E) 95°

**10.** [AB] // [CD],
m(BAC) = 120°
m(CBD) = 8x,
m(ACB) = 3x,
m(BDC) = 60°
⇒ **x = ?**



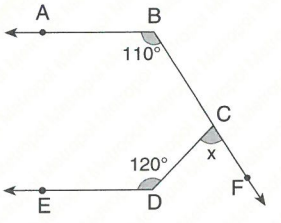

A) 10° B) 12° C) 14° D) 16° E) 20°

**11.** [AB] // [DC],
[AD] // [BC],
m(ABD) = m(DBC),
m(BAC) = 52°
m(CAD) = 48°
⇒ **m(BDC) = x = ?**




A) 38° B) 40° C) 42° D) 44° E) 46°

**12.** [BA // [DE,
m(ABC) = 110°,
m(EDC) = 120°
⇒ **m(DCF) = x = ?**

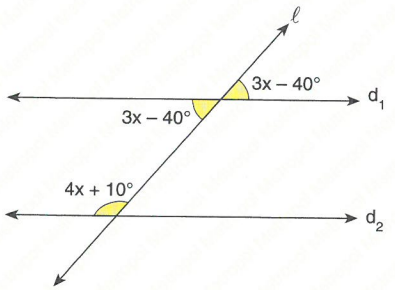



A) 40° B) 50° C) 60° D) 70° E) 80°

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | C | A | A | A | A | B | B | C | B | B | B |

1.



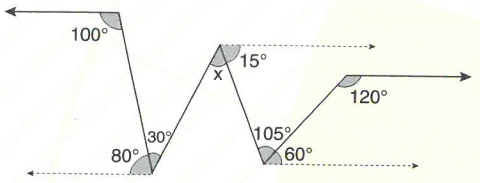

$d_1 // d_2 \Rightarrow 3x - 40° + 4x + 10° = 180°$

$7x = 210°$

$x = 30°$

Yanıt / Answer B

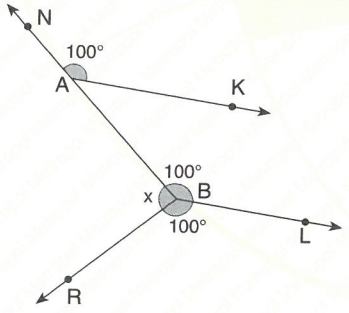
2.




$110° = x + 15° \Rightarrow x = 95°$

Yanıt / Answer C

3.



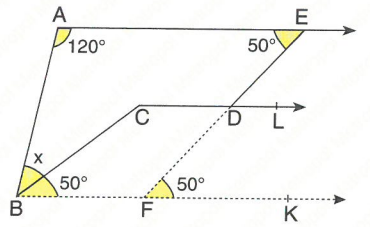

$[AK // [BL \Rightarrow m(\widehat{NAK}) = m(\widehat{ABL})$

$x + 100° + 100° = 360°$

$x = 160°$

Yanıt / Answer A

4.



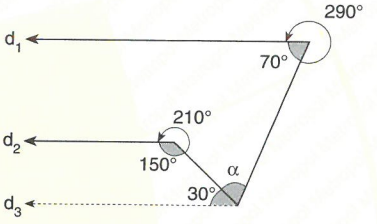

$m(A\widehat{E}D) = m(D\widehat{F}K) = m(C\widehat{B}F) = 50$

$120 + x + 50 = 180°$

$\Rightarrow x = 10°$

Yanıt / Answer A

5.



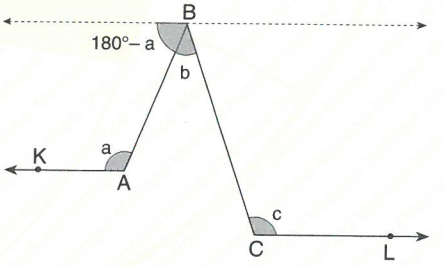

$d_1 // d_2 // d_3$

$70° + 30° + \alpha = 180°$

$\alpha = 80°$

Yanıt / Answer A

6.



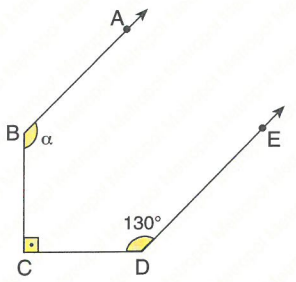

$180 - a + b = c$

$a - b = 60° \Rightarrow 180 - 60 = c$

$c = 120°$

Yanıt / Answer A

**7.**



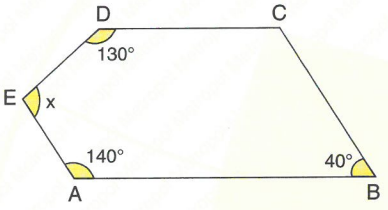

[BA // [DE

$\Rightarrow \alpha + 130° + 90° = 360°$

$\alpha = 140°$

**Yanıt / Answer B**

**8.**



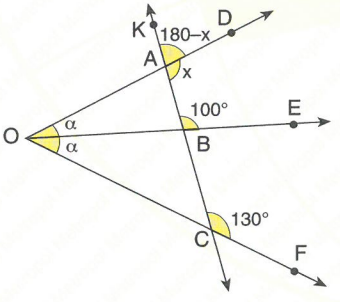

[CB] // [EA] $\Rightarrow$ $m(\widehat{EAB}) = 140°$

[DC] // [AB] $\Rightarrow$ $x + 140° + 130° = 360°$

$x = 360° - 270° = 90°$

**Yanıt / Answer B**

**9.**




$m(\widehat{KAD}) = 180 - x$

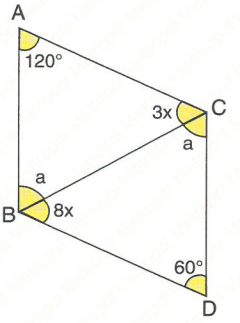
$100 = \dfrac{180 - x + 130}{2}$

$200 = 310$

$\Rightarrow x = 110°$

**Yanıt / Answer C**

**10.**




[AB] // [CD]

$m(\widehat{ABC}) = m(\widehat{BCD})$

$3x + a + 120° = 180° \Rightarrow 3x + a = 60°$

$8x + a + 60° = 180° \Rightarrow 8x + a = 120°$

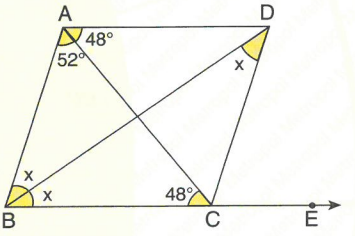
$-/\ 3x+a=60°$

$+\ 8x+a=120°$

$5x=60° \Rightarrow x=12°$

**Yanıt / Answer B**

**11.**




[AB] // [CD]

$m(\widehat{CDB}) = m(\widehat{CBD}) = x$

[AD] // [BC]

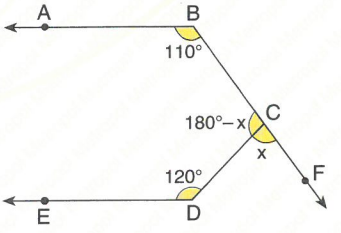
$\Rightarrow 52° + 48° + 2x = 180°$

$2x = 180° - 100°$

$2x = 80° \Rightarrow x = 40°$

**Yanıt / Answer B**

**12.**




[BA // [DE $\Rightarrow$ $110° + 120° + 180° - x = 360°$

$x = 50°$

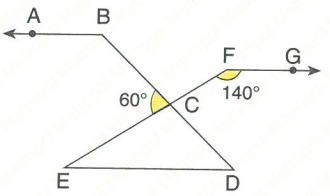
**Yanıt / Answer B**

**1.** [BA // [ED] // [FG,

$m(\widehat{BCE}) = 60°$,

$m(\widehat{CFG}) = 140°$

$\Rightarrow$ **$m(\widehat{ABC}) = ?$**

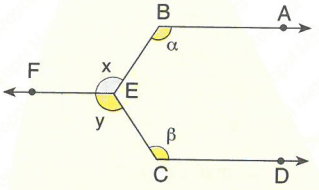



A) 110° B) 120° C) 135° D) 150° E) 160°

**2.** [BA // [CD // [EF,

$\frac{x}{y} = \frac{2}{3}$

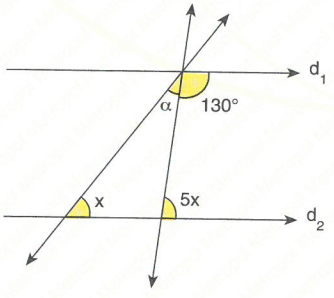
$\Rightarrow \frac{\alpha}{\beta} = ?$




A) $\frac{1}{2}$ B) $\frac{2}{3}$ C) $\frac{3}{2}$ D) 1 E) $\frac{5}{2}$

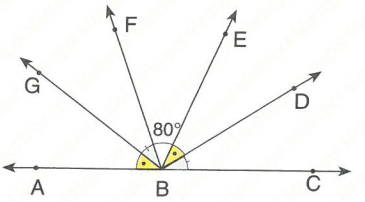
**3.** $d_1 // d_2$

$\Rightarrow \alpha = ?$




A) 10° B) 20° C) 30° D) 40° E) 50°

**4.**




$m(\widehat{ABG}) = m(\widehat{EBD}) =, m(\widehat{FBG}) = m(\widehat{DBC})$,

$m(\widehat{FBE}) = 80° \Rightarrow$ **$m(\widehat{GBD}) = ?$**

A) 100° B) 110° C) 130° D) 145° E) 160°

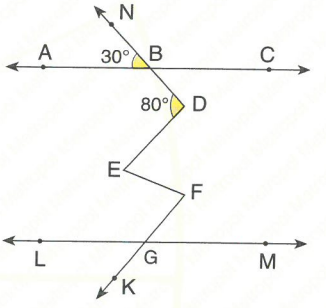
**5.** AC // LM,

[ED] // [GF],

$m(\widehat{ABN}) = 30°$,

$m(\widehat{BDE}) = 80°$

$\Rightarrow$ **$m(\widehat{FGL}) = ?$**



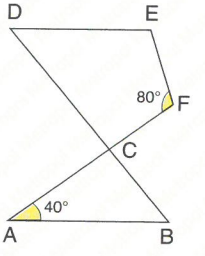

A) 100° B) 110° C) 120° D) 130° E) 150°

**6.** [DE] // [AB],

$m(\widehat{CAB}) = 40°$

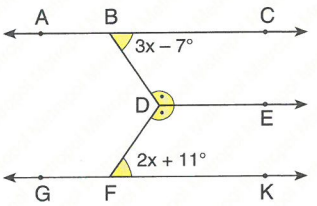
$m(\widehat{AFE}) = 80°$

$\Rightarrow$ **$m(\widehat{DEF}) = ?$**



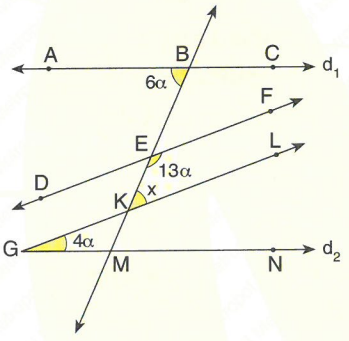

A) 150° B) 140° C) 130° D) 120° E) 110°

**7.** AC // GK // [DE,
$m(\widehat{BDE}) = m(\widehat{EDF})$,
$M(\widehat{CBD}) = 3x-7°$,
$m(\widehat{DFK}) = 2x + 11°$
$\Rightarrow$ **x = ?**



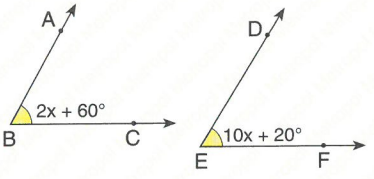

A) 15° B) 18° C) 21° D) 24° E) 27°

**8.** AC // [GN,
DF // [GL,
$m(\widehat{ABE}) = 6\alpha$
$m(\widehat{FEK}) = 13\alpha$,
$m(\widehat{EKL}) = x$,
$m(\widehat{KGM}) = 4\alpha$
$\Rightarrow$ **$m(\widehat{EKL}) = x = ?$**



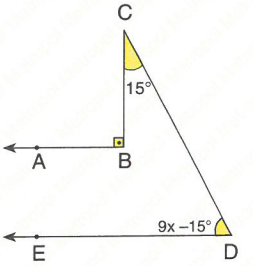

A) 12° B) 24° C) 36° D) 48° E) 60°

**9.** [BA // [ED,
[BC // [EF
$\Rightarrow$ **x = ?**



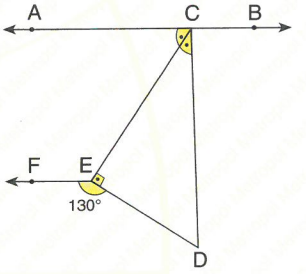

A) 5° B) 6° C) 7° D) 8° E) 9°

**10.** [BA // [DE,
[BA ⊥ [CB],
$m(\widehat{BCD}) = 15°$,
$m(\widehat{CDE}) = 9x-15°$
$\Rightarrow$ **x = ?**



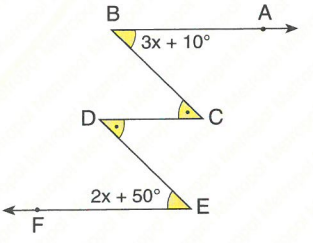

A) 10° B) 12° C) 14° D) 16° E) 18°

**11.** AB // [EF,
[CE] ⊥ [ED],
$m(\widehat{ACE}) = m(\widehat{ECD})$,
$m(\widehat{FED}) = 130°$
$\Rightarrow$ **$m(\widehat{CDE}) = ?$**




A) 30° B) 40° C) 50° D) 60° E) 70°

**12.** [BA // [EF,
$m(\widehat{BCD}) = m(\widehat{CDE})$,
$m(\widehat{ABC}) = 3x + 10°$,
$m(\widehat{FED}) = 2x + 50°$
$\Rightarrow$ **x = ?**

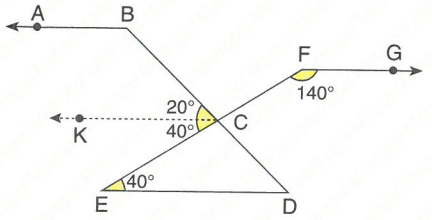



A) 10° B) 20° C) 30° D) 40° E) 50°

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | B | D | C | D | B | B | B | A | A | C | D |

**1.**




AB] // [FG // [CK

$m(\widehat{CFG}) = 140° \Rightarrow m(\widehat{CED}) = 40°$

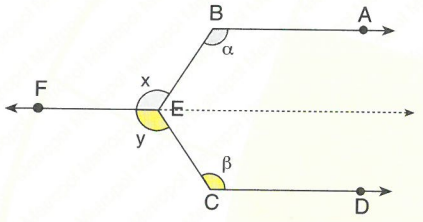
$m(\widehat{CED}) = 40° \Rightarrow m(\widehat{ECK}) = 40°$

$m(\widehat{CED}) = m(\widehat{KCE}) = 40°$

$m(\widehat{BCK}) = 20 \Rightarrow m(\widehat{ABC}) = 160°$

**Yanıt / Answer E**

**2.**



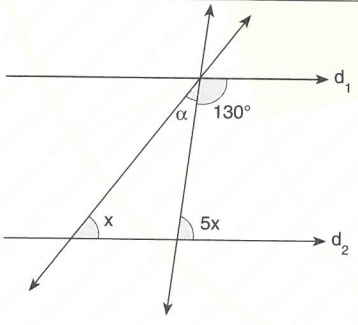

[BA // [EF $\Rightarrow \alpha = x$

[CD // [EF $\Rightarrow \beta = y$

$\frac{x}{y} = \frac{\alpha}{\beta} = \frac{2}{3}$

**Yanıt / Answer B**

**3.**




$d_1 // d_2 \Rightarrow 130° + 5x = 180°$

$5x = 50°$

$x = 10°$

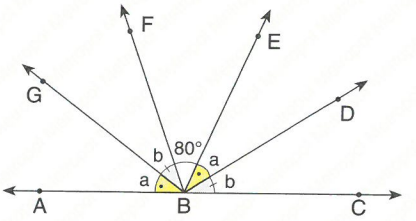
$130 + \alpha + x = 180°$

$140° + \alpha = 180°$

$\alpha = 40°$

**Yanıt / Answer D**

**4.**



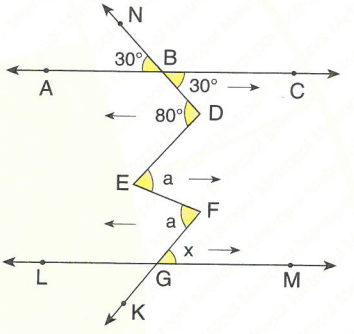

$80° + a + a + b + b = 180°$

$a + b = 50°$

$m(\widehat{GBD}) = 80° + a + b = 80° + 50° = 130°$

**Yanıt / Answer C**

**5.**




[ED] // [GF]

$m(\widehat{DEF}) = m(\widehat{EFG})$

$30° + a + x = 80° + a$

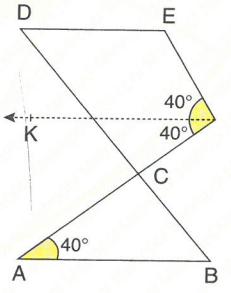
$x = 50°$

$m(\widehat{FGL}) = 180° - x = 130°$

[İç ters açılar / interior opposite angles]

**Yanıt / Answer D**

**6.**




[DE] // [FK // [AB]

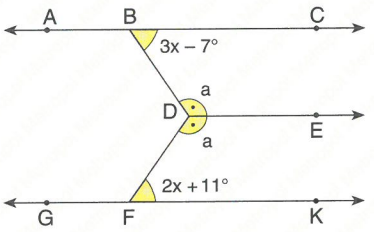
$m(\widehat{KFC}) = m(\widehat{CAB}) = 40°$

$m(\widehat{EFK}) = 40°$

$\Rightarrow m(\widehat{DEF}) = 140°$

**Yanıt / Answer B**

**7.**




$2x + 11° + a = 180°$

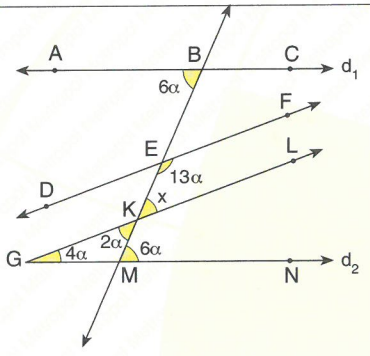
$3x - 7° + a = 180°$

$\Rightarrow 3x - 7° = 2x + 11°$

$x = 18°$

**Yanıt / Answer B**

**8.**




$d_1 // d_2 \Rightarrow$

$m(\widehat{ABE}) = m(\widehat{BMN})$

$x = 2\alpha$

$[DF // [GL \Rightarrow 13\alpha + 2\alpha = 180°$

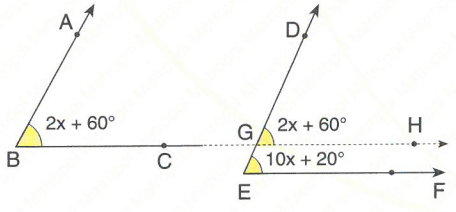
$15\alpha = 180°$

$\alpha = 12°$

$x = 2\alpha \Rightarrow x = 2 \cdot 12° = 24°$

**Yanıt / Answer B**

**9.**




$[BA // [ED$ & $[BC // [EF$

$m(\widehat{DEF}) = m(\widehat{DGH})$

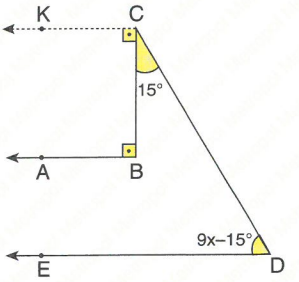
$m(\widehat{DGH}) = m(\widehat{DGH})$

$2x + 60° = 10x + 20°$

$8x = 40° \Rightarrow x = 5°$

**Yanıt / Answer A**

**10.**




$[CK // [DE // [BA$

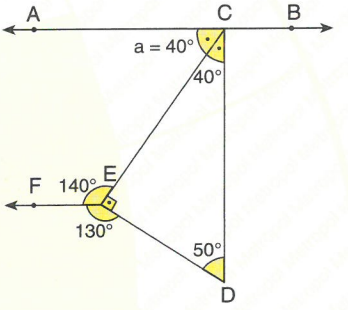
$m(\widehat{KCB}) = 90°$

$90° + 15° + 9x - 15° = 180°$

$9x = 90° \Rightarrow x = 10°$

**Yanıt / Answer A**

**11.**



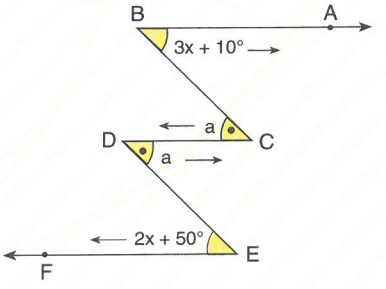

$[CA // [EF$ , $m(\widehat{FEC}) = 140°$

$\Rightarrow m(\widehat{ACE}) = m(\widehat{ECD}) = 40°$

$\Rightarrow m(\widehat{CDE}) = 50°$

**Yanıt / Answer C**

**12.**




$[BC] // [DE]$

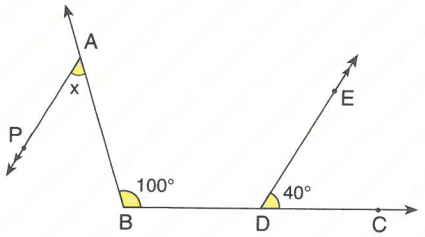
$\Rightarrow (\widehat{BCD}) = m(\widehat{CDE})$

$3x + 10° + a = a + 2x + 50°$

$x = 40°$

**Yanıt / Answer D**

**1.**

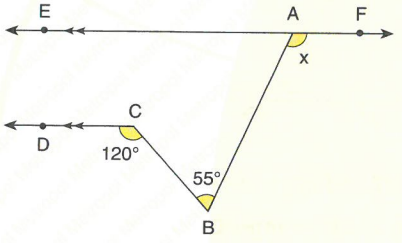



[AP // [DE, m($\widehat{ABC}$) = 100°, m($\widehat{EDC}$)= 40°

⇒ **m($\widehat{BAP}$) = ?**

A) 40° B) 45° C) 50° D) 55° E) 60°

**2.**

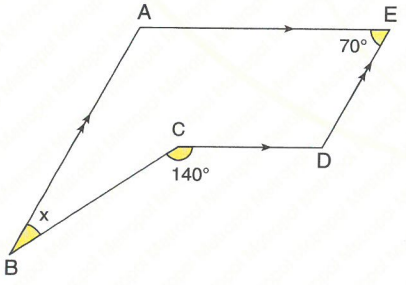



EF // [CD, m($\widehat{DCB}$) = 120°, m($\widehat{CBA}$)= 55°

⇒ **m($\widehat{BAF}$) = x = ?**

A) 100° B) 110° C) 115° D) 120° E) 125°

**3.**




[AB] // [DE], [AE] // [CD], m($\widehat{AED}$) = 70°,

m($\widehat{DCB}$) = 140° ⇒ **m($\widehat{ABC}$) = x = ?**

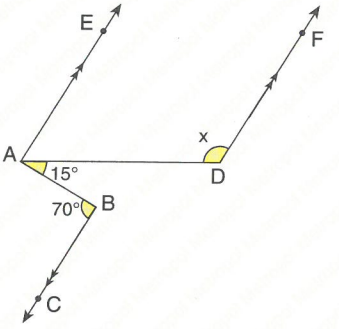
A) 25° B) 30° C) 35° D) 40° E) 45°

**4.** [AE // [DF // [BC,

m($\widehat{DAB}$) = 15°,

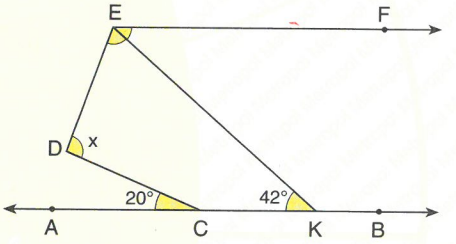
m($\widehat{ABC}$) = 70°

⇒ **m($\widehat{ADF}$) = x = ?**




A) 95° B) 100° C) 110° D) 115° E) 125°

**5.**



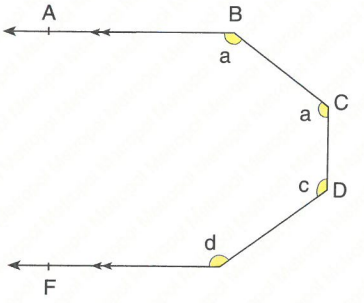

[EF // AB, 2 · m($\widehat{DEK}$) = 3 · m($\widehat{KEF}$), m($\widehat{DCA}$) = 20°

m($\widehat{EKA}$) = 42° ⇒ **m($\widehat{EDC}$) = x = ?**

A) 95° B) 100° C) 105° D) 110° E) 115°

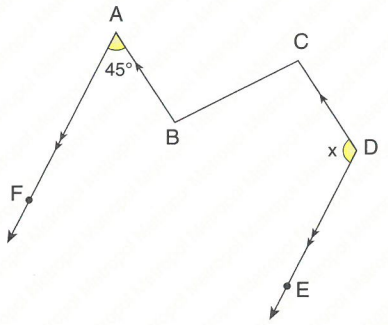
**6.** AB] // [EF

⇒ **a + b + c + d = ?**




A) 180 B) 270 C) 360 D) 540 E) 720

**7.**

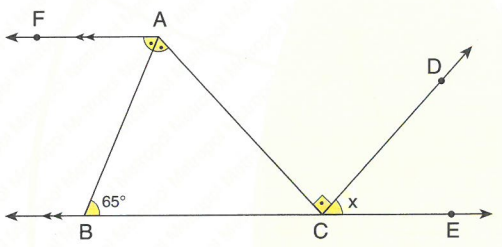



[AF // [DE, [DC] // [AB], $m(\widehat{FAB}) = 45°$

$\Rightarrow$ **$m(\widehat{CDE}) = x = ?$**

A) 115° B) 120° C) 125° D) 130° E) 135°

**8.**

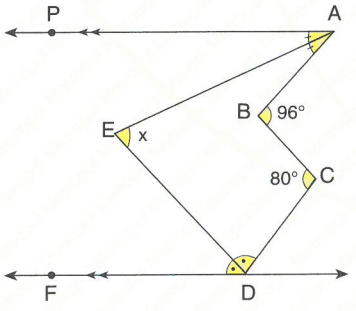



[AF // BE, $m(\widehat{FAB}) = m(\widehat{BAC})$, $m(\widehat{ABC}) = 65°$

[AC] ⊥ [CD $\Rightarrow$ **$m(\widehat{DCE}) = x = ?$**

A) 40° B) 45° C) 50° D) 55° E) 65°

**9.**



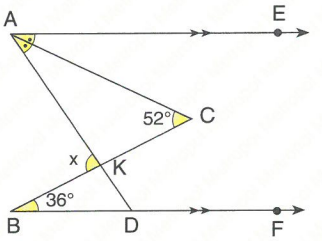

[AP // DF, $m(\widehat{ABC}) = 96°$, $m(\widehat{BCD}) = 80°$,

$m(\widehat{PAE}) = m(\widehat{EAB})$, $m(\widehat{CDE}) = m(\widehat{EDF})$

$\Rightarrow$ **$m(\widehat{AED}) = x = ?$**

A) 88° B) 94° C) 96° D) 98° E) 100°

**10.**

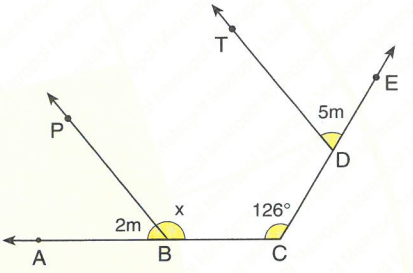



[AE // [BF, $m(\widehat{ACB}) = 52°$, $m(\widehat{CBF}) = 36°$

$m(\widehat{EAC}) = m(\widehat{CAD})$ $\Rightarrow$ **$m(\widehat{AKB}) = x = ?$**

A) 68° B) 70° C) 72° D) 74° E) 78°

**11.**

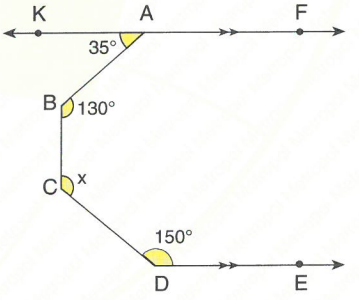



[BP // [DT, $m(\widehat{PBA}) = 2m$, $m(\widehat{TDE}) = 5m$

$m(\widehat{DCB}) = 126°$ $\Rightarrow$ **$m(\widehat{PBC}) = x = ?$**

A) 136° B) 140° C) 144° D) 148° E) 150°

**12.**




[KF // [DE, $m(\widehat{ACB}) = 130°$, $m(\widehat{CDE}) = 150°$

$m(\widehat{KAB}) = 35°$ $\Rightarrow$ **$m(\widehat{BCD}) = x = ?$**

A) 110° B) 115° C) 120° D) 125° E) 130°

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | C | B | E | A | D | E | A | D | A | C | B |

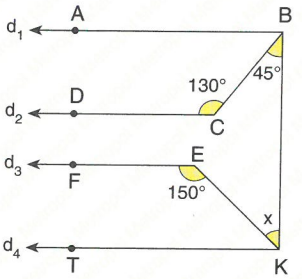
**1.** $d_1 // d_2 // d_3 // d_4$,

$m(\widehat{BCD}) = 130°$,

$m(\widehat{CBK}) = 45°$,

$m(\widehat{FEK}) = 150°$

$\Rightarrow$ **$m(\widehat{EKB}) = x = ?$**




A) 45° B) 50° C) 55° D) 60° E) 65°

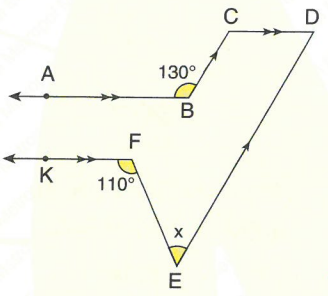
**2.** [CD] // [BA // [FK,

[BC] // [DE],

$m(\widehat{ABC}) = 130°$,

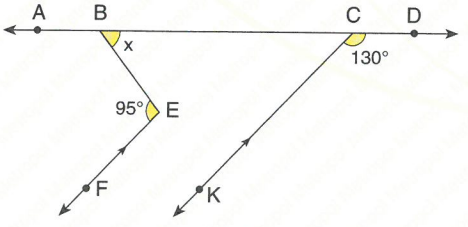
$m(\widehat{KFE}) = 110°$

$\Rightarrow$ **$m(\widehat{DEF}) = x = ?$**




A) 40° B) 45° C) 50° D) 55° E) 60°

**3.**




[EF // [CK, $m(\widehat{DCK}) = 130°$, $m(\widehat{BEF}) = 95°$

$\Rightarrow$ **$m(\widehat{CBE}) = x = ?$**

A) 40° B) 45° C) 50° D) 55° E) 60°

**4.** [BA // [DK, [DC] // [EF,

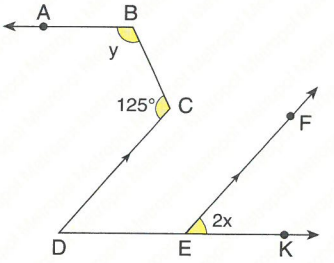
$m(\widehat{ABC}) = y$,

$m(\widehat{BCD}) = 125°$,

$m(\widehat{FEK}) = 2x$,

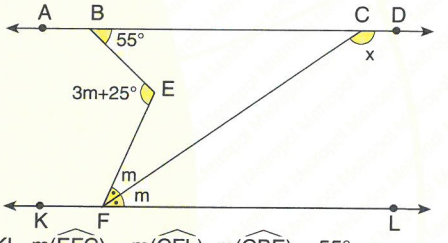
$x + y = 115°$

$\Rightarrow$ **$y - x = ?$**




A) 60° B) 65° C) 70° D) 75° E) 80°

**5.**

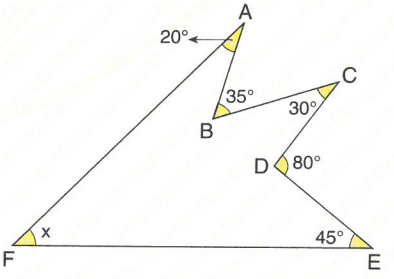



AD // KL, $m(\widehat{EFC}) = m(\widehat{CFL})$, $m(\widehat{CBE}) = 55°$

$m(\widehat{BEF}) = 3m + 25° \Rightarrow$ **$m(\widehat{DCF}) = x = ?$**

A) 130° B) 135° C) 140° D) 145° E) 150°

**6.**

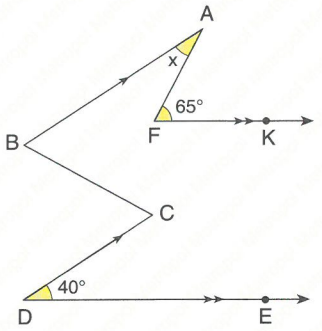



$m(\widehat{FAB}) = 20°$, $m(\widehat{ABC}) = 35°$, $m(\widehat{BCD}) = 30°$,

$m(\widehat{CDE}) = 80°$, $m(\widehat{DEF}) = 45° \Rightarrow$ **$m(\widehat{AFE}) = x = ?$**

A) 20° B) 25° C) 30° D) 35° E) 40°

**7.**

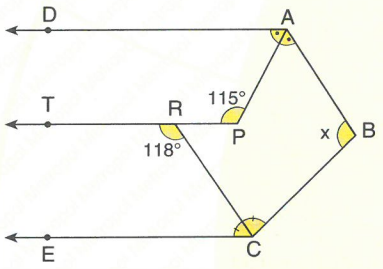



[FK // [DE, [AB] // [DC], m($\widehat{CDE}$) = 40°, m($\widehat{AFK}$) = 65°,

⇒ **m($\widehat{FAB}$) = ?**

A) 20° B) 25° C) 30° D) 35° E) 40°

**8.**




[PT // [AD // [CE, m($\widehat{DAP}$) = m($\widehat{PAB}$),

m($\widehat{BCR}$)= m($\widehat{RCE}$), m($\widehat{TRC}$) = 118°, m($\widehat{APR}$) = 115°

⇒ **m($\widehat{ABC}$) = x = ?**

A) 100° B) 104° C) 106° D) 108° E) 112°

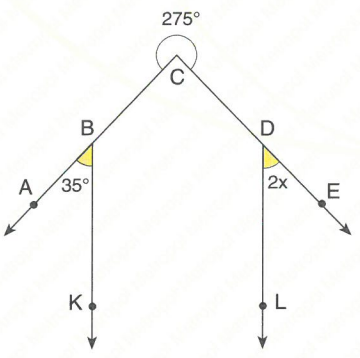
**9.** [BK // [DL,

m($\widehat{ACE}$) = 275°,

m($\widehat{ABK}$) = 35°,

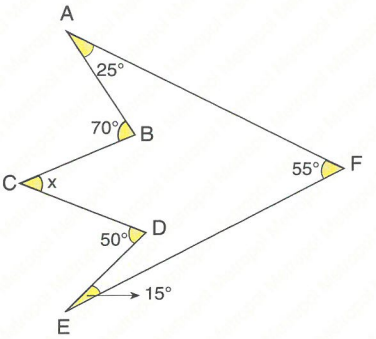
m($\widehat{EDL}$) = 2x

⇒ **x = ?**




A) 25° B) 35° C) 40° D) 45° E) 50°

**10.**

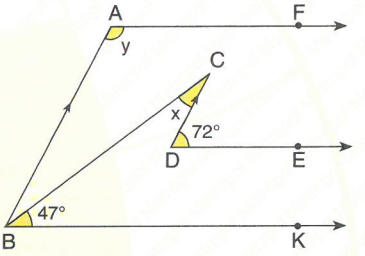



m($\widehat{FAB}$) = 25°, m($\widehat{ABC}$) = 70°, m($\widehat{CDE}$) = 50°,

m($\widehat{DEF}$) = 15, m($\widehat{AFE}$) = 55° ⇒ **m($\widehat{BCD}$) = x = ?**

A) 20° B) 25° C) 30° D) 35° E) 40°

**11.**

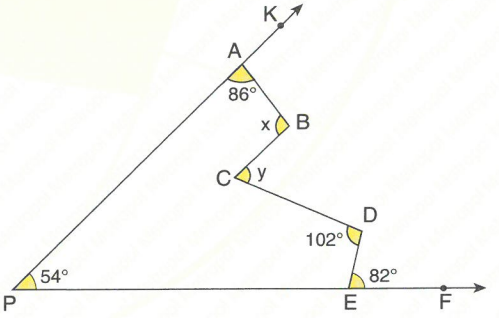



[AB] // [DC], [AF // [DE // [BK, m($\widehat{CDE}$) = 72°,

m($\widehat{CBK}$) = 47°, m($\widehat{FAB}$) = y, m($\widehat{BCD}$) = x ⇒ **y–x = ?**

A) 75° B) 78° C) 80° D) 83° E) 85°

**12.**




m($\widehat{PAB}$) = 86°, m($\widehat{CDE}$) = 102°, m($\widehat{DEF}$) = 82°,

m($\widehat{APE}$) = 54°, m($\widehat{ABC}$) = x, m($\widehat{BCD}$) = y ⇒ **x–y = ?**

A) 12° B) 14° C) 16° D) 18° E) 20°

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | E | B | D | E | A | B | C | A | B | D | E |

# BÖLÜM CHAPTER 2

## TARİHSEL NOT / HISTORICAL NOTE

### Isaac Newton [1643 – 1727]

İngiliz matematikçi, fizikçi, astronom, mucit, filozof, ilahiyatçı. Newton 1661 yılında Cambridge'de Trinity College'e girdi. Cambridge'deki üç yıl boyunca cebir, geometri ve trigonometri dersleri aldı. Alan, yay uzunluğu, tanjant bulma gibi eskiden kullanılan yöntemleri diferansiyel hesaplamayı temel alarak birleştirdi. 1667'de Newton , üniversite tekrar açılınca Cambridge'e geri döndü ve iki yıl sonra matematik profesörü oldu. Newton tarihin en önemli bilim eserlerinden biri olan "Philosophi√Naturalis Principia Mathematica (Doğa Felsefesinin Matematiksel İlkeleri)" kitabını Latince yayınladı. Kitapta ispatlar geometri ile yapılmış, evrensel kütle çekimi açıklanmış ve cisimlerin kütleleri ile doğru orantılı, mesafeleri ile ters orantılı birbirlerini çektiklerini açıklamıştır.

English mathematician, physicist, astronomer, inventor, philosopher, and theologian. Newton entered Trinity College in Cambridge in 1661. For three years in Cambridge he studied algebra, geometry and trigonometry. He combined previously used methods in area, arc length, and tangent with findings based on differential calculation. In 1667, Newton returned to Cambridge when the university was reopened, and two years later he became a professor of mathematics. Newton published one of the most important works of science in history, the "Philosophi√Naturalis Principia Mathematica (The Mathematical Principles of Nature Philosophy)" book in Latin. In the book, the proofs were made with geometry, explaining universal gravitational attraction, and explaining that they are in direct proportion to the masses of objects and inversely proportional to their distances.

# ÜÇGENDE AÇILAR
# ANGLES in a TRIANGLE

**Bu bölüm 48 çözümlü test sorusu ve 24 test sorusu içermektedir.**

**This chapter includes 48 test questions with solutions and 24 test questions.**

**BÖLÜM / CHAPTER 2**

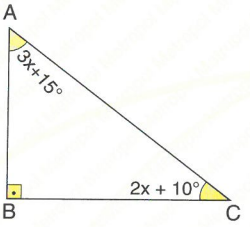
**ÜÇGENDE AÇILAR / ANGLES in a TRIANGLE**

**1.** $[AB] \perp [BC]$,

$m(\widehat{BAC}) = 3x + 15°$,

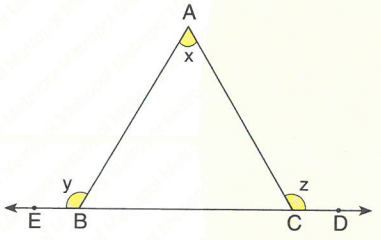
$m(\widehat{BCA}) = 2x + 10°$

$\Rightarrow$ **x = ?**




A) 12° B) 13° C) 14° D) 15° E) 16°

**2.**




$m(\widehat{BAC}) = x$, $m(\widehat{ABE}) = y$ $m(\widehat{ACD}) = z$,

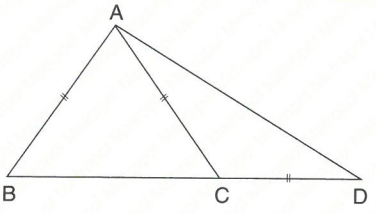
$x + y + z = 260°$ $\Rightarrow$ **x = ?**

A) 20° B) 30° C) 40° D) 50° E) 60°

**3.** $|AB| = |AC| = |CD|$,

$m(\widehat{BAD}) = 60°$

$\Rightarrow$ **$m(\widehat{DCA})$ = ?**



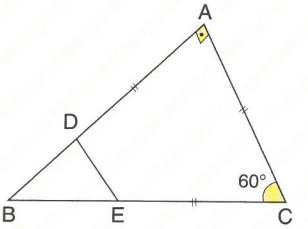

A) 100° B) 80° C) 60° D) 40° E) 20°

**4.** $[BA] \perp [AC]$,

$|AD| = |AC| = |EC|$,

$m(\widehat{ACB}) = 60°$

$\Rightarrow$ **$m(\widehat{BDE})$ = ?**



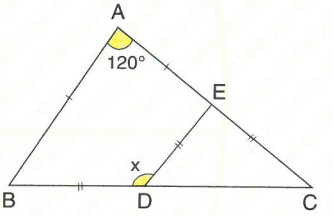

A) 100° B) 105° C) 110° D) 115° E) 120°

**5.** $|AB| = |AE|$,

$|BD| = |DE| = |EC|$,

$m(\widehat{BAC}) = 120°$

$\Rightarrow$ **$m(\widehat{BDE})$ = x = ?**



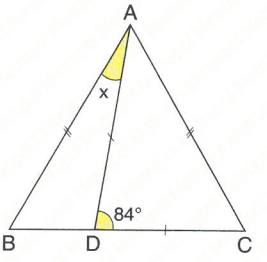

A) 170° B) 160° C) 150° D) 140° E) 130°

**6.** $|AB| = |AC|$,

$|AD| = |DC|$,

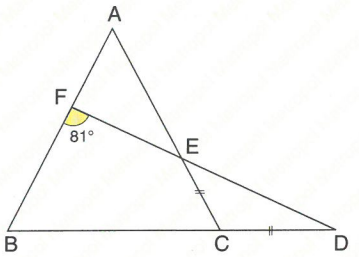
$m(\widehat{ADC}) = 84°$

$\Rightarrow$ **$m(\widehat{BAD})$ = x = ?**



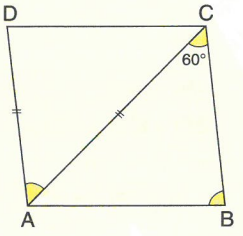

A) 12° B) 24° C) 36° D) 48° E) 60°

**7.** IABI = IACI,
IECI = ICDI,
$m(\widehat{BFD}) = 81°$
$\Rightarrow$ **$m(\widehat{BAC}) = ?$**



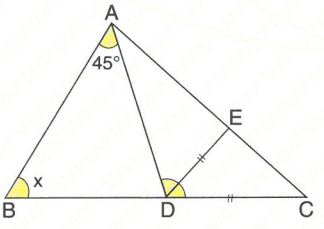

A) 12° B) 24° C) 36° D) 48° E) 60°

**8.** [AB] // [DC],
IADI = IACI,
$m(\widehat{DAC}) = m(ABC)$
$m(\widehat{ACB}) = 60°$
$\Rightarrow$ **$m(\widehat{CAB}) = ?$**



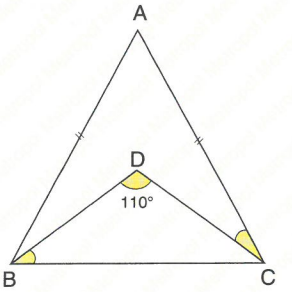

A) 40° B) 50° C) 60° D) 70° E) 80°

**9.** IABI = IACI,
IDEI = IDCI,
$m(\widehat{ADE}) = m(\widehat{EDC})$
$m(\widehat{BAD}) = 45°$
$\Rightarrow$ **$m(\widehat{ABD}) = ?$**



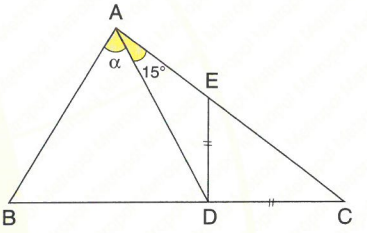

A) 27° B) 36° C) 45° D) 54° E) 63°

**10.** IABI = IACI,
$m(\widehat{DBC}) = m(\widehat{DCA})$
$m(\widehat{BDC}) = 60°$
$\Rightarrow$ **$m(\widehat{BAC}) = ?$**



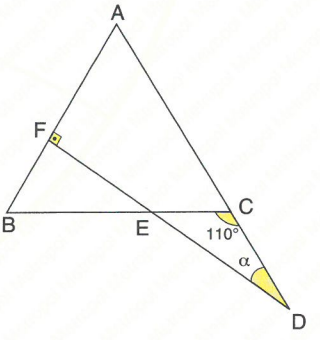

A) 40° B) 60° C) 70° D) 80° E) 90°

**11.** IABI = IACI = IBDI,
IEDI = IDCI,
$m(\widehat{DAC}) = 15°$,
$m(\widehat{BAD}) = \alpha$
$\Rightarrow$ **$\alpha = ?$**




A) 35° B) 45° C) 55° D) 65° E) 75°

**12.** ICBI = ICAI,
[DF] ⊥ [AB],
$m(\widehat{BCD}) = 110°$
$\Rightarrow$ **$m(\widehat{EDC}) = \alpha = ?$**

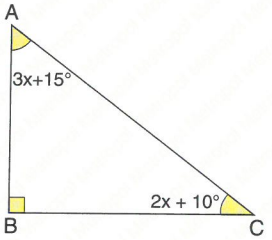



A) 20° B) 30° C) 35° D) 40° E) 45°

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | C | A | B | B | C | D | C | E | A | D | C |

**1.**



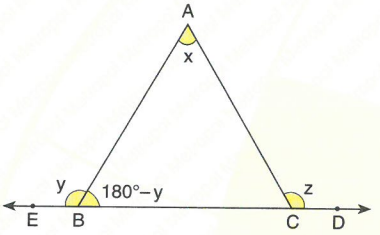

$3x + 15° + 2x + 10° + 90° = 180°$

$5x = 65°$

$x = 13°$

**Yanıt / Answer B**

**2.**




$x + 180° - y = z \Rightarrow y + z = 180° + x$

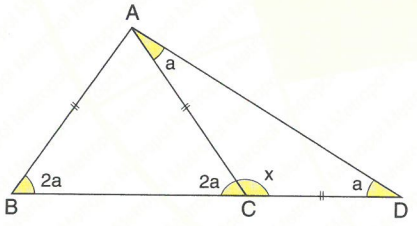
$x + y + z = 260°$

$x + 180° + x = 260°$

$2x = 80° \Rightarrow x = 40°$

**Yanıt / Answer C**

**3.**




$m(\widehat{BAD}) = 60°$

$2a + 60° + a = 180°$

$3a = 120° \Rightarrow a = 40°$

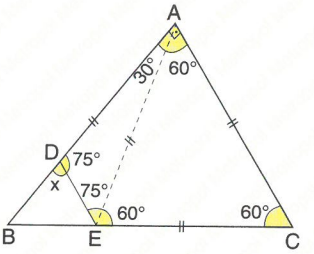
$x + 2a = 180°$

$x + 2\cdot 40° = 180°$

$x = 100°$

**Yanıt / Answer A**

**4.**




[AE] çizilirse / if [AE] is drawn

$|AE| = |AC| = |EC| \Rightarrow m(\widehat{EAC}) = m(\widehat{AEC}) = 60°$

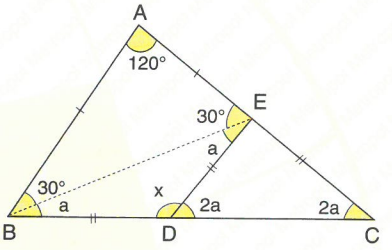
$|AD| = |AE| \Rightarrow m(\widehat{ADE}) = m(\widehat{AED}) = 75°$

$x = 180° - 75°$

$x = 105°$

**Yanıt / Answer B**

**5.**




[BE] çizilirse / if [BE] is drawn

$120° + 30° + 3a = 180°$

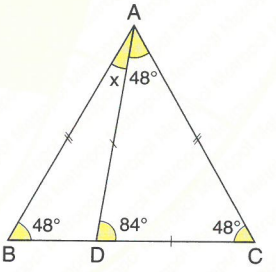
$3a = 30° \Rightarrow a = 10°$

$x + 2a = 180°$

$x + 2\cdot 10° = 180° \Rightarrow x = 160°$

**Yanıt / Answer B**

**6.**




$|AD| = |DC| \Rightarrow m(\widehat{DAC}) = m(\widehat{DCA}) = 48°$

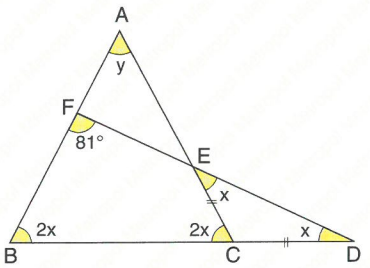
$|AB| = |AC| \Rightarrow m(\widehat{ABC}) = m(\widehat{ACB}) = 48°$

$x + 48° = 84°$

$x = 36°$

**Yanıt / Answer C**

**7.**




$|EC| = |CD| \Rightarrow m(\widehat{D}) = m(C\widehat{E}D) = x$

$|AB| = |AC| \Rightarrow m(\widehat{B}) = m(B\widehat{C}A) = 2x$

$81° + 3x = 180°$

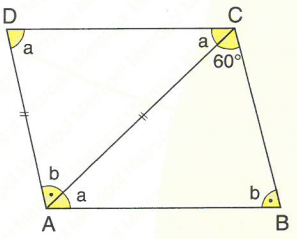
$3x = 99° \Rightarrow x = 33°$

$4x + y = 180°$

$4 \cdot 33 + y = 180° \Rightarrow y = 48°$

**Yanıt / Answer D**

**8.**




$[AB] // [DC] \Rightarrow$

$m(\widehat{DCA}) = m(\widehat{CAB})$

$a + b + 60° = 180° \Rightarrow a + b = 120° \ldots (1)$

$2a + b = 180° \ldots (2)$

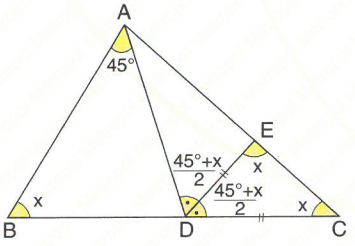
$-/ \ a + b = 120°$

$+ \ 2a + b = 180°$

$a = 60°$

**Yanıt / Answer C**

**9.**




$|AB| = |AC| \Rightarrow m(ACB) = x$

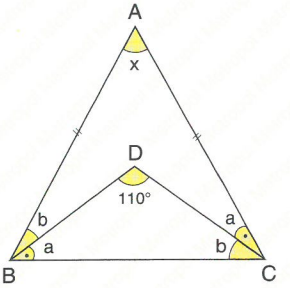
$2x + \frac{45 + x}{2} = 180°$

$4x + 45 + x = 360°$

$5x = 315° \Rightarrow x = 63°$

**Yanıt / Answer E**

**10.**




$a + b + 110° = 180°$

$a + b = 70°$

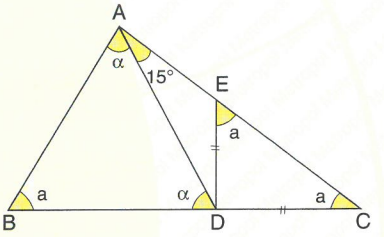
$a + b + a + b + x = 180°$

$2(a + b) + x = 180°$

$2 \cdot 70° + x = 180° \Rightarrow x = 40°$

**Yanıt / Answer A**

**11.**




$|AB| = |AC| = |BD|$

$a + 2\alpha = 180°$

$\alpha = a + 15$

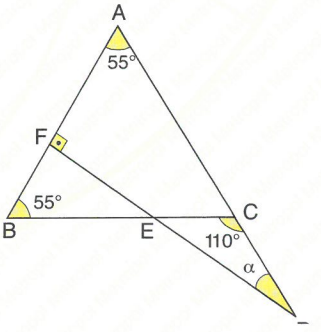
$\Rightarrow a + 2a + 30 = 180°$

$a = 50$

$\alpha = 50 + 15 = 65$

**Yanıt / Answer D**

**12.**



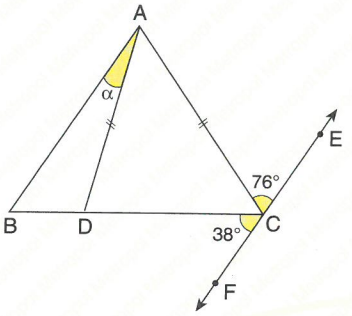

$|CB| = |CA| \Rightarrow m(\widehat{A}) = m(\widehat{B}) = 55°$

$\alpha + 90° + 55° = 180°$

$\alpha = 35°$

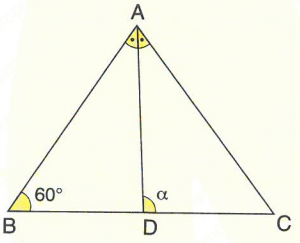
**Yanıt / Answer C**

**1.** [AB] // EF,
IADI = IACI,
$(\widehat{ACE}) = 76°$
$m(\widehat{DCF}) = 38°$
$\Rightarrow$ **$m(\widehat{BAD}) = \alpha = ?$**



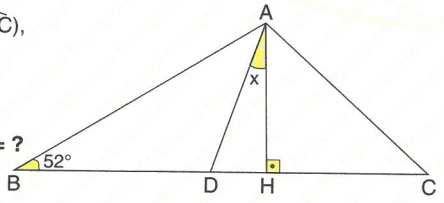

A) 28° B) 30° C) 32° D) 36° E) 40°

**2.** $m(\widehat{BAD}) = m(\widehat{DAC})$,
$m(\widehat{ABC}) = 60°$,
$m(\widehat{BAC}) - m(\widehat{BCA}) = 40°$
$\Rightarrow$ **$m(\widehat{ADC}) = \alpha = ?$**



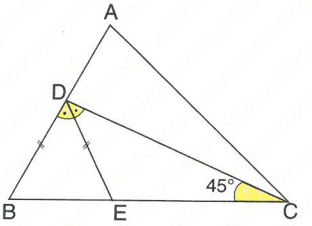

A) 100° B) 95° C) 90° D) 85° E) 80°

**3.** IBAI = IBCI,
$m(\widehat{BAD}) = m(\widehat{DAC})$,
$[AH] \perp [BC]$,
$m(\widehat{ABD}) = 52°$
$\Rightarrow$ **$m(\widehat{DAH}) = x = ?$**



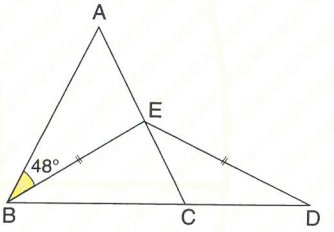

A) 4° B) 5° C) 6° D) 8° E) 10°

**4.** IACI = ICBI,
IBDI = IDEI,
$m(\widehat{BDE}) = m(\widehat{EDC})$,
$m(\widehat{DCE}) = 45°$
$\Rightarrow$ **$m(\widehat{BAC}) = ?$**



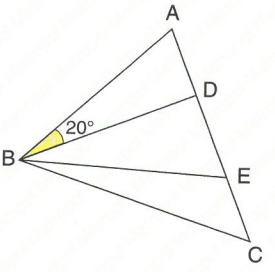

A) 60° B) 65° C) 70° D) 75° E) 80°

**5.** IABI = IACI,
IBEI = IEDI,
$m(\widehat{ABE}) = 48°$
$\Rightarrow$ **$m(\widehat{CED}) = ?$**



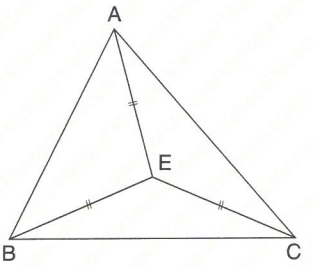

A) 12° B) 24° C) 36° D) 48° E) 60°

**6.** IABI = IAEI,
IBDI = IDCI,
$m(\widehat{ABD}) = 20°$
$\Rightarrow$ **$m(\widehat{EBC}) = ?$**



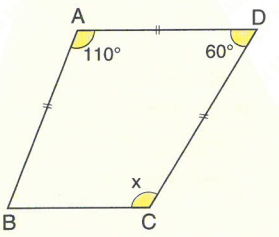

A) 10° B) 15° C) 20° D) 25° E) 30°

**7.** $m(\widehat{ABC}) = 60°$,
$|AE| = |EC| = |BE|$
$\Rightarrow$ **$m(\widehat{EAC}) = ?$**



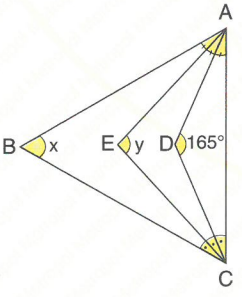

A) 25° B) 30° C) 35° D) 40° E) 50°

**8.** $|AB| = |AD| = |DC|$,
$m(\widehat{BAD}) = 110°$,
$m(\widehat{ADC}) = 50°$
$\Rightarrow$ **$m(\widehat{BCD}) = x = ?$**




A) 110° B) 115° C) 120° D) 125° E) 130°

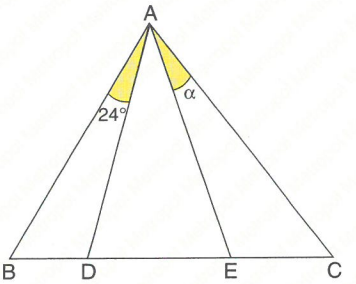
**9.**




$m(\widehat{BAE}) = m(\widehat{EAD}) = m(\widehat{DAC})$,
$m(\widehat{BCE}) = m(\widehat{ECD}) = m(\widehat{DCA})$,
$m(\widehat{ADC}) = 165° \Rightarrow$ **$x + y = ?$**

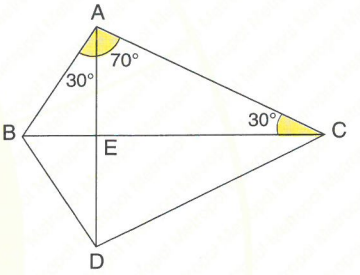
A) 200° B) 220° C) 240° D) 255° E) 285°

**10.** $|AE| = |EB|$,
$|AC| = |CD|$,
$m(\widehat{BAD}) = 24°$
$\Rightarrow$ **$m(\widehat{EAC}) = \alpha = ?$**



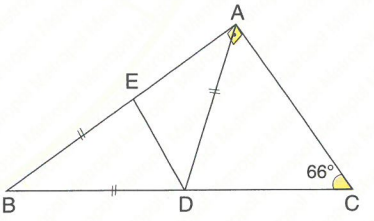

A) 16° B) 32° C) 48° D) 64° E) 80°

**11.** $m(\widehat{BAE}) = 30°$
$m(\widehat{EAC}) = 70°$,
$m(\widehat{ACB}) = 30°$
$|AB| = |AD|$
$\Rightarrow$ **$m(\widehat{EBD}) = ?$**




A) 25° B) 30° C) 35° D) 40° E) 50°

**12.** $|BE| = |BD| = |AD|$,
$m(\widehat{C}) = 66°$
$\Rightarrow$ **$m(\widehat{ADE}) = ?$**

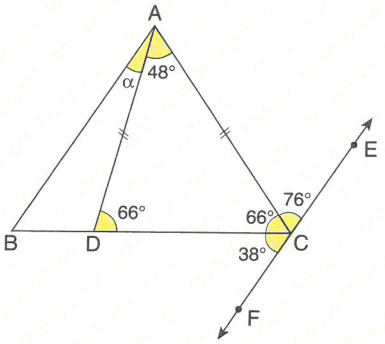



A) 27° B) 36° C) 45° D) 54° E) 63°

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | A | C | D | D | A | B | D | E | C | A | D |

**1.**



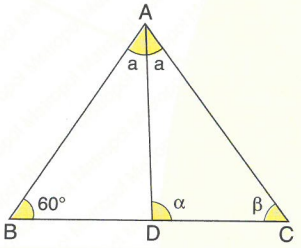

[BA] // FE

$\Rightarrow m(\widehat{BAC}) = m(\widehat{ACE})$

$\alpha + 48° = 76° \Rightarrow \alpha = 28°$

**Yanıt / Answer A**

**2.**




$2a - \beta = 40°$

$+\ \ 2a + \beta = 120°$

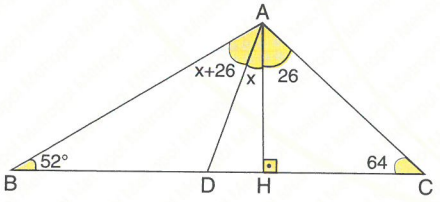
$4a = 160° \Rightarrow a = 40°$

$\alpha = a + 60°$

$\alpha = 40° + 60° = 100°$

**Yanıt / Answer A**

**3.**

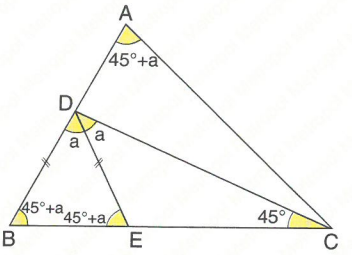



$2x + 26° = 38°$

$2x = 12° \Rightarrow x = 6°$

**Yanıt / Answer C**

**4.**



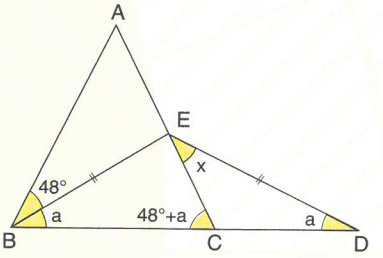

$90° + 3a = 180° \Rightarrow a = 30°$

$m(\widehat{BAC}) = 45° + a$

$= 45° + 30° = 75°$

**Yanıt / Answer D**

**5.**

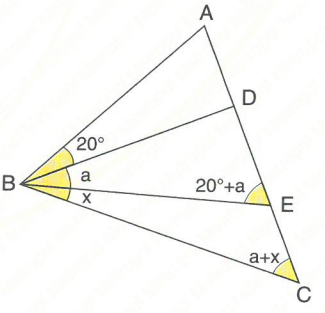



$|AB| = |AC| \Rightarrow m(\widehat{ABC}) = m(\widehat{ACB})$

$x + a = 48° + a \Rightarrow x = 48°$

**Yanıt / Answer D**

**6.**




$|AB| = |AE|$

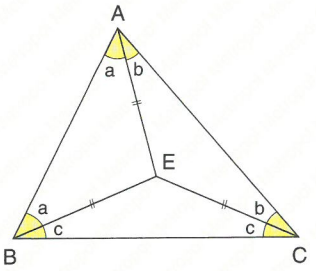
$|BD| = |DC|$

$a + x + x = 20° + a$

$2x = 20° \Rightarrow x = 10°$

**Yanıt / Answer A**

**7.**




$m(\widehat{ABC}) = 60°$

$\Rightarrow a + b + a + c + c + b = 180°$

$2(a + c) + 2b = 180°$

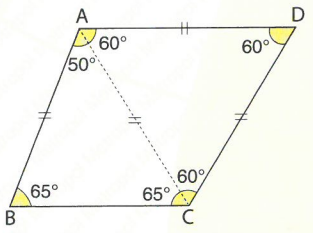
$120° + 2b = 180°$

$2b = 60°$

$b = 30°$

**Yanıt / Answer B**

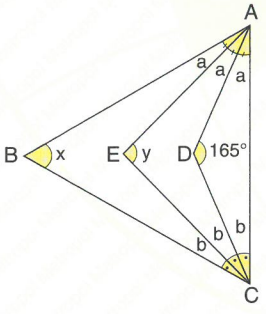
**8.**




$x = 60° + 65° = 125°$

**Yanıt / Answer D**

**9.**




$a + b + 165° = 180°$

$a + b = 15°$

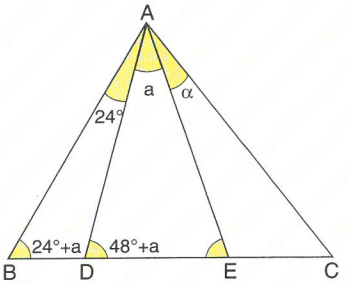
$3a + 3b + x = 180° \Rightarrow x = 135°$

$2a + 2b + y = 180° \Rightarrow y = 150°$

$x + y = 135° + 150° = 285°$

**Yanıt / Answer E**

**10.**




$|AE| = |EB| \Rightarrow m(\widehat{BAE}) = m(\widehat{ABE}) = 24° + a$

$m(\widehat{ADE}) = 48° + a$

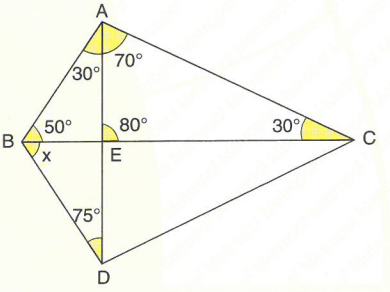
$|AC| = |DC|$

$\Rightarrow 48° + a = a + \alpha$

$\alpha = 48°$

**Yanıt / Answer C**

**11.**

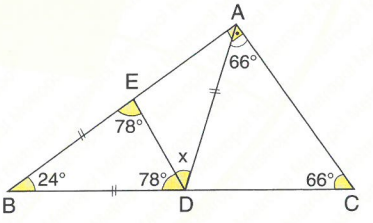



$|AB| = |AD| \Rightarrow m(\widehat{ABD}) = m(\widehat{ADB}) = 75°$

$x + 50° = 75° \Rightarrow x = 25°$

**Yanıt / Answer A**

**12.**




$\left.\begin{array}{l} m(\widehat{A}) = 90° \\ |AD| = |BD| \end{array}\right\} \Rightarrow |AD| = |BD| = |DC|$

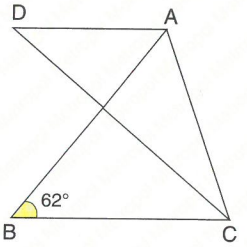
$66° + 66° = 78° + x$

$132° = 78° + x$

$x = 54°$

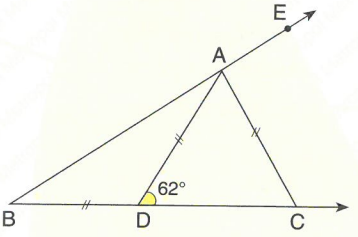
**Yanıt / Answer D**

**1.** [AD] // [BC],
|BA| = |BC|,
|AC| = AD|,
$m(\widehat{B}) = 62°$
$\Rightarrow$ **$m(\widehat{D}) = ?$**



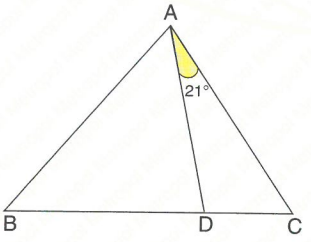

A) 29,5° B) 30° C) 31,5° D) 32° E) 35°

**2.** |BD| = |AD| = |AC|,
$m(\widehat{ADC}) = 62°$
$\Rightarrow$ **$m(\widehat{EAC}) = ?$**



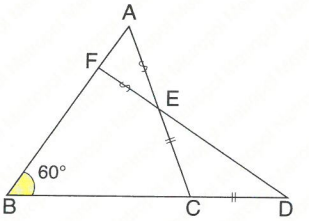

A) 87° B) 90° C) 93° D) 95° E) 100°

**3.** |AB| = |BC| = |AD|,
$m(\widehat{CAD}) = 21°$
$\Rightarrow$ **$m(\widehat{ADC}) = ?$**



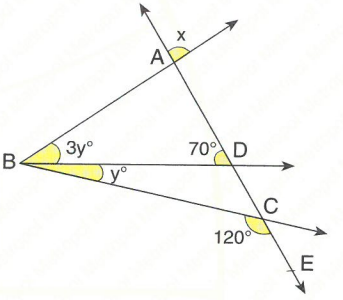

A) 99° B) 103° C) 106° D) 109° E) 116°

**4.** |CD| = |CE|,
|EA| = |EF|
$m(\widehat{ABD}) = 60°$
$\Rightarrow$ **$m(\widehat{CDE}) = ?$**



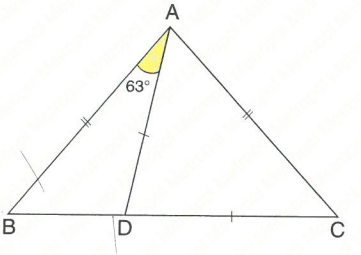

A) 10° B) 12° C) 15° D) 20° E) 25°

**5.** $m(\widehat{ADB}) = 70°$,
$m(\widehat{ABD}) = 3y°$,
$m(\widehat{DBC}) = y°$
$m(\widehat{BCE}) = 120°$
$\Rightarrow$ **x = ?**



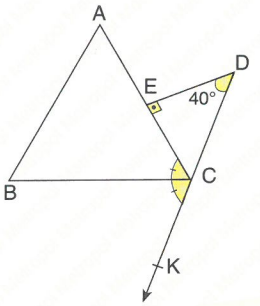

A) 80° B) 75° C) 70° D) 65° E) 60°

**6.** |AB| = |AC|,
|AD| = |DC|,
$m(\widehat{BAD}) = 63°$
$\Rightarrow$ **$m(\widehat{ADB}) = ?$**



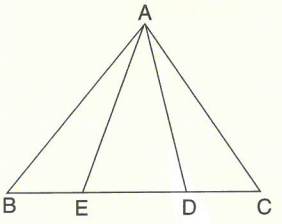

A) 39° B) 42° C) 56° D) 63° E) 78°

**7.** [AB] // [DK,
[DE] ⊥ [AC],
$m(\widehat{ACB})) = m(\widehat{BCK})$,
$m(\widehat{D}) = 40°$
⇒ **$m(\widehat{B})$ = ?**



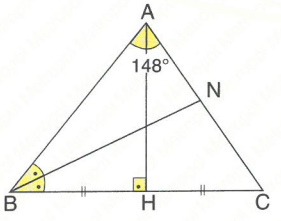

A) 50° B) 55° C) 65° D) 70° E) 75°

**8.** |AB| = |BD|,
|AC| = |CE|,
$m(\widehat{EAD}) = 30°$
⇒ **$m(\widehat{BAC})$ = ?**



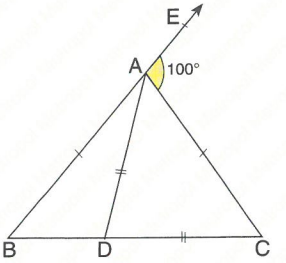

A) 150° B) 140° C) 130° D) 120° E) 110°

**9.** $m(\widehat{ABN}) = m(\widehat{CBN})$,
|BH| = |HC|,
[AH] ⊥ [BC],
$m(\widehat{BAC}) = 148$
⇒ **$m(\widehat{ANB})$= ?**



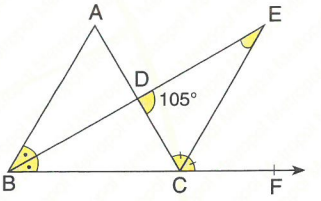

A) 8° B) 12° C) 16° D) 18° E) 24°

**10.** |AB| = |AC|,
|AD| = |DC|,
$m(\widehat{EAC}) = 100°$
⇒ **$m(\widehat{BAD})$ = ?**



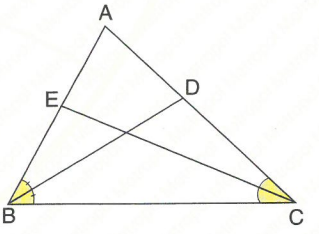

A) 15° B) 18° C) 20° D) 25° E) 30°

**11.** |AB| = |AC|,
$m(\widehat{ACE}) = m(\widehat{ECF})$,
$m(\widehat{ABE}) = m(\widehat{CBE})$,
$m(\widehat{EDC}) = 105°$
⇒ **$m(\widehat{E})$ = ?**




A) 20° B) 30° C) 40° D) 42° E) 45°

**12.** $m(\widehat{BEC}) = 95°$,
$m(\widehat{BDC}) = 85°$
⇒ **$m(\widehat{A})$ = ?**

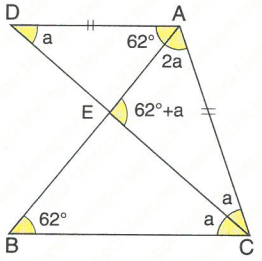



A) 52° B) 54° C) 56° D) 58° E) 60°

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | C | C | D | A | E | C | D | E | E | A | E |

**1.**




$$\left.\begin{array}{l} |AD| = |AC| \\ [AD] \parallel [BC] \end{array}\right\} \Rightarrow \begin{array}{l} m(\widehat{DAE}) = m(\widehat{ABC}) \\ m(\widehat{ADC}) = m(\widehat{DCB}) \end{array}$$

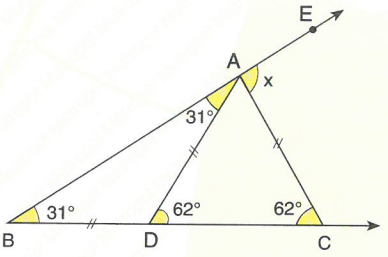
$|AB| = |BC| \Rightarrow m(\widehat{BAC}) = m(\widehat{BCA})$

$62° + 4a = 180°$

$a = 29{,}5°$

**Yanıt / Answer A**

**2.**




$|AD| = |AC| \Rightarrow m(\widehat{ACD}) = 62°$

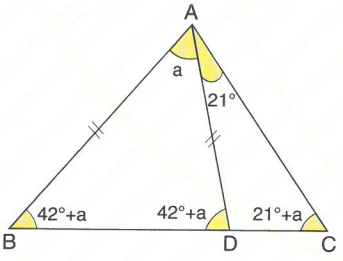
$|AD| = |BD| \Rightarrow m(\widehat{ABD}) = m(\widehat{BAD}) = 31$

$31° + 62° = x$

$x = 93°$

**Yanıt / Answer C**

**3.**




$|AB| = |BC| = |AD|$

$|AB| = |BC| \Rightarrow m(\widehat{BAC}) = m(\widehat{BCA})$

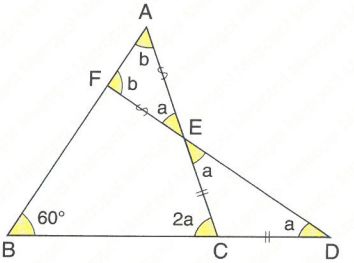
$42° + a + a + 42° + a = 180°$

$84° + 3a = 180° \Rightarrow a = 32°$

$m(\widehat{ADC}) = 180° - (42° + a) = 106°$

**Yanıt / Answer C**

**4.**




$b + 2a + 60° = 180°$

$b + 2a = 120°$

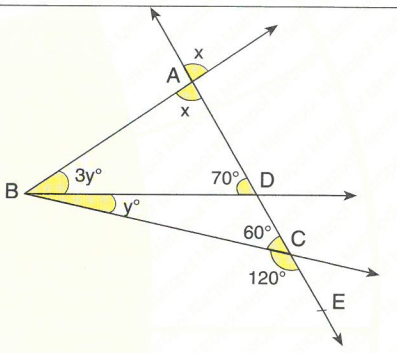
$a + 2b = 180°$

$a + 2(120° - 2a) = 180°$

$240° - 3a = 180° \Rightarrow a = 20°$

**Yanıt / Answer D**

**5.**



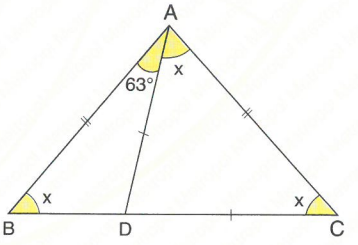

$y + 60° = 70° \Rightarrow y = 10°$

$x + 4y + 60° = 180°$

$x + 4 \cdot 10° + 60° = 180° \Rightarrow x = 80°$

**Yanıt / Answer A**

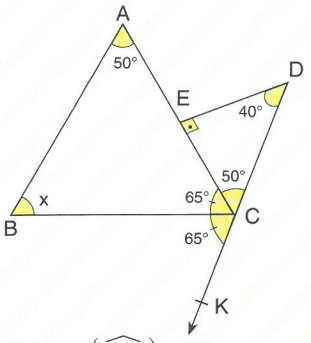
**6.**




$$\left.\begin{array}{l} 63° + 3x = 180° \\ x = 39° \end{array}\right\} \Rightarrow m(\widehat{ADB}) = 2x = 78°$$

**Yanıt / Answer E**

**7.**




$m(\widehat{EDC}) = 40° \Rightarrow m(\widehat{ECD}) = 50°$

$m(\widehat{ECD}) = 50° \Rightarrow m(\widehat{BCK}) = 65°$

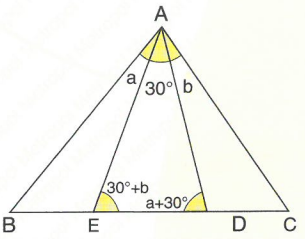
[AB] // [DK]

$\Rightarrow m(\widehat{ABC}) = m(\widehat{BCK})$

$x = 65°$

**Yanıt / Answer C**

**8.**




$|AB| = |BD|$

$|AC| = |CE|$

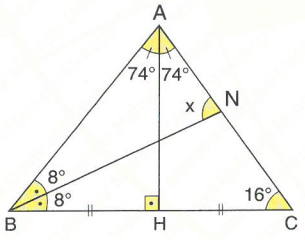
$30° + 30° + b + 30° + a = 180°$

$a + b = 90°$

$m(\widehat{BAC}) = 30° + a + b = 120°$

**Yanıt / Answer D**

**9.**



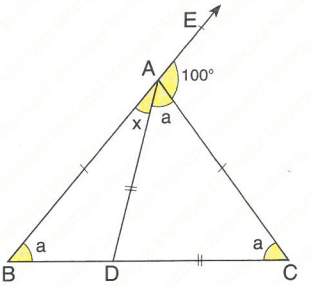

$\left.\begin{array}{l}[AH] \perp [BC] \\ |BC| = |HC|\end{array}\right\} \Rightarrow \begin{array}{l}|AB| = |AC| \\ m(\widehat{BAH}) = m(\widehat{HAC})\end{array}$

$|AB| = |AC| \Rightarrow m(\widehat{B}) = m(\widehat{C})16°$

$x + 148° + 8° = 180° \Rightarrow x = 180° - 156° = 24°$

**Yanıt / Answer E**

**10.**



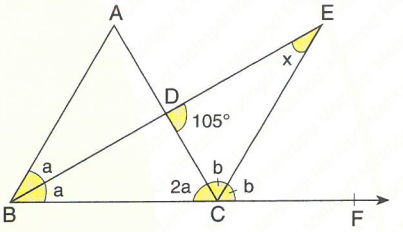

$2a = 100 \Rightarrow a = 50°$

$x + a = 80°$

$x + 50° = 80° \Rightarrow x = 30°$

**Yanıt / Answer E**

**11.**




$|AB| = |AC|$

$3a = 105° \Rightarrow a = 35°$

$2a + 2b = 180° \Rightarrow b = 55°$

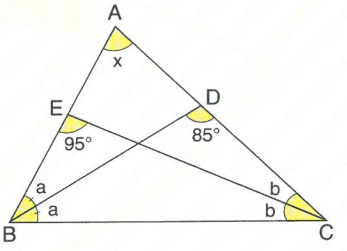
$105° + x + b = 180°$

$105° + x + 55° = 180°$

$x = 180° - 160° = 20°$

**Yanıt / Answer A**

**12.**




$2a + b + 95° = 180° \Rightarrow 2a + b = 85°$

$2b + a + 85° = 180° \Rightarrow 2b + a = 95°$

$2a + b = 85°$

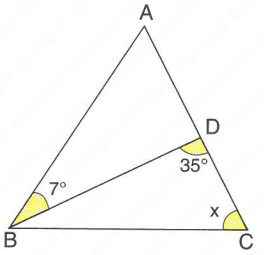
$+\ 2b + a = 95°$

$3(a + b) = 180° \Rightarrow a + b = 60°$

$2(a + b) + x = 180° \Rightarrow x = 60°$

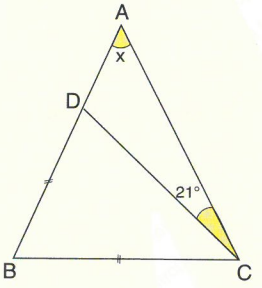
**Yanıt / Answer E**

**1.** $|AB| = |AC|$,
$m(\widehat{ABD}) = 7°$,
$m(\widehat{BDC}) = 35°$
$\Rightarrow$ **x = ?**



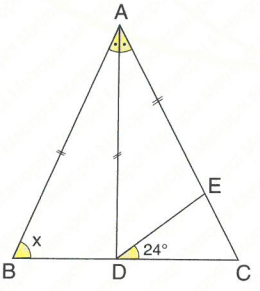

A) 74° B) 75° C) 76° D) 77° E) 78°

**2.** $|AB| = |AC|$,
$|BC| = |BD|$,
$m(\widehat{ACD}) = 21°$
$\Rightarrow$ **$m(\widehat{BAC}) = x$ = ?**



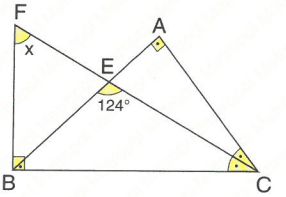

A) 32° B) 33° C) 37° D) 39° E) 41°

**3.** $m(\widehat{BAD}) = m(\widehat{DAC})$,
$|AB| = |AD| = |AE|$,
$m(\widehat{EDC}) = 24°$
$\Rightarrow$ **$m(\widehat{ABC}) = x$ = ?**




A) 66° B) 72° C) 76° D) 78° E) 82°

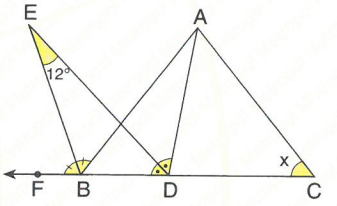
**4.**




$[BA] \perp [AC]$, $[FB] \perp [BC]$, $m(\widehat{ACF}) = m(\widehat{FCB})$,
$m(\widehat{BEC}) = 124° \Rightarrow$ **$m(\widehat{BFC}) = x$ = ?**

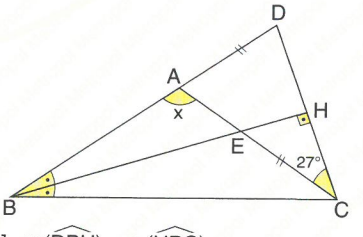
A) 72° B) 66° C) 62° D) 56° E) 54°

**5.** $m(\widehat{EBF}) = m(\widehat{EBA})$,
$m(\widehat{FDE}) = m(\widehat{EDA})$,
$|AC| = |DC| = |AB|$,
$m(\widehat{BED}) = 12°$
$\Rightarrow$ **$m(\widehat{ACF}) = x$ = ?**




A) 44° B) 46° C) 48° D) 52° E) 54°

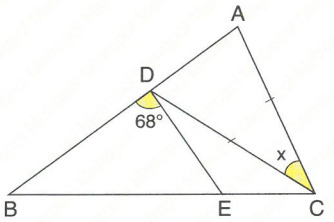
**6.**




$[BH] \perp [DC]$, $m(\widehat{DBH}) = m(\widehat{HBC})$,
$|EC| = |DA|$, $m(\widehat{ACD}) = 27° \Rightarrow$ **$m(\widehat{BAC}) = x$ = ?**

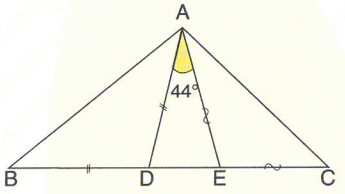
A) 108° B) 112° C) 118° D) 124° E) 126°

**7.** [DE] // [AC],
|CA| = |CD|,
m($\widehat{BDE}$) = 68°
⇒ **x = ?**



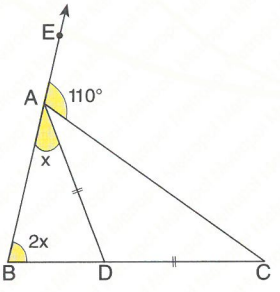

A) 34° B) 38° C) 40° D) 42° E) 44°

**8.** |BD| = |DA|,
|AE| = |EC|,
m($\widehat{DAE}$) = 44°
⇒ **m($\widehat{BAC}$) = ?**



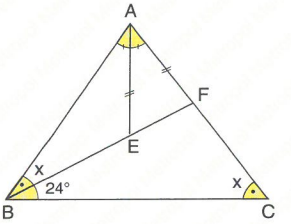

A) 112° B) 110° C) 108° D) 106° E) 102°

**9.** |DC| = |DA|,
m($\widehat{ABD}$) = 2x,
m($\widehat{BAD}$) = x,
m($\widehat{EAC}$)= 110°
⇒ **x = ?**



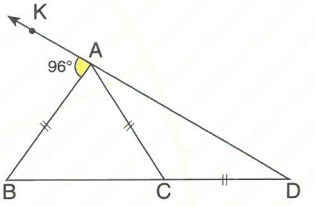

A) 45° B) 40° C) 35° D) 30° E) 25°

**10.** m($\widehat{BAE}$) = m($\widehat{EAF}$),
m($\widehat{FBC}$) = 24°,
m($\widehat{ABF}$) = m($\widehat{ACB}$) = x
|AE| = |AF|
⇒ **m($\widehat{ACD}$)= x = ?**



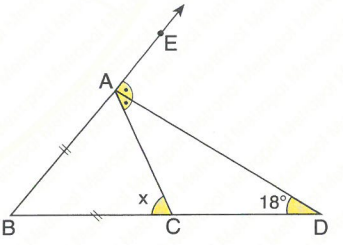

A) 44° B) 46° C) 48° D) 52° E) 54°

**11.** |AB| = |AC| = |CD|,
m($\widehat{KAB}$) = 96°
⇒ **m($\widehat{CAD}$) = ?**




A) 45° B) 40° C) 35° D) 32° E) 25°

**12.** m($\widehat{EAD}$) = m($\widehat{DAC}$).
|AB| = |BC|,
m($\widehat{ADB}$)=18
⇒ **m($\widehat{ACB}$)= x = ?**

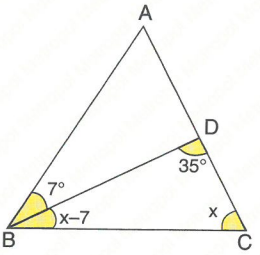



A) 54° B) 66° C) 72° D) 76° E) 84°

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | A | D | D | A | E | E | A | B | E | D | C |

1.




$|AB| = |AC| \Rightarrow m(\widehat{ABC}) = m(\widehat{ACB}) = x$

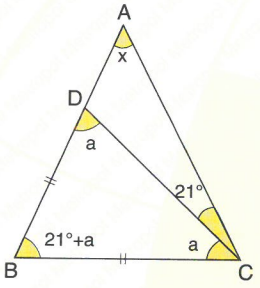
$x - 7° + 35° + x = 180°$

$2x = 152°$

$x = 76°$

**Yanıt / Answer C**

2.




$|AB| = |AC| \Rightarrow m(\widehat{ABC}) = m(\widehat{ACB}) = 21° + a$

$|DB| = |BC| \Rightarrow m(\widehat{BDC})) = m(\widehat{BCD}) = a$

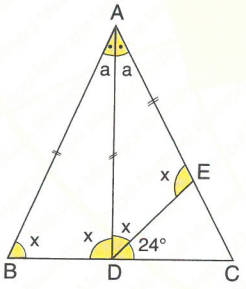
$21° + 3a = 180° \Rightarrow a = 53°$

$x + 21° = a$

$x + 21° = 53° \Rightarrow x = 32°$

**Yanıt / Answer A**

3.




$m(\widehat{BAD}) = m(\widehat{DAE}) = a$

$m(\widehat{B}) = m(\widehat{BDA}) = x \Rightarrow m(\widehat{ADE}) = m(\widehat{DEA}) = x$

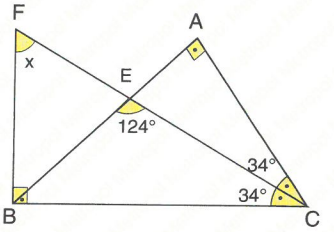
$2x + 24° = 180°$

$2x = 156°$

$x = 78°$

**Yanıt / Answer D**

4.




$m(\widehat{BEC}) = 124°$ $m(\widehat{ACE}) = 34°$

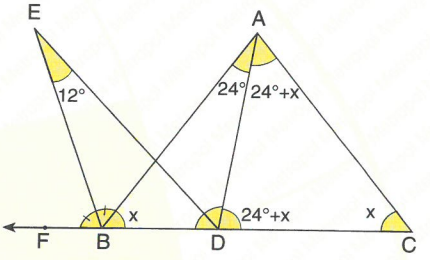
$m(\widehat{ACE}) = 34° \Rightarrow m(\widehat{ECB}) = 34°$

$90° + 34° + x = 180°$

$x = 56°$

**Yanıt / Answer D**

5.




$|AC| = |AB| \Rightarrow m(ACB) = m(\widehat{ABC})$

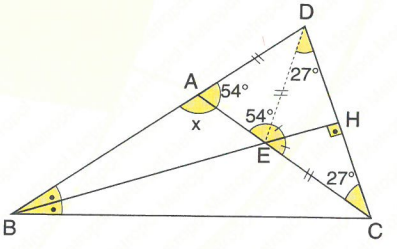
$m(\widehat{BAD}) = 2 \cdot m(\widehat{BED}) = 24°$

$48° + 3x = 180°$

$3x = 132° \Rightarrow x = 44°$

**Yanıt / Answer A**

6.




$\left.\begin{array}{l}[BH] \perp [DC] \\ m(\widehat{DBH}) = m(\widehat{CBH})\end{array}\right\} \Rightarrow |DH| = |HC|$

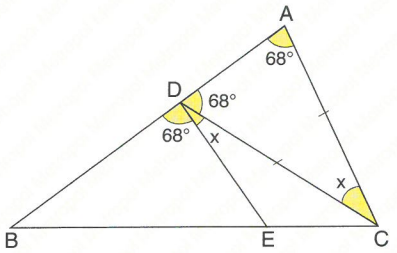
$\left.\begin{array}{l}|DH| = |HC| \\ [EH] \perp [DC]\end{array}\right\} \Rightarrow |DE| = |EC|$

$x + 54° = 180°$

$x = 126°$

**Yanıt / Answer E**

**7.**




[DE] // [AC] ⇒

$m(\widehat{BDE}) = m(\widehat{BAC})$

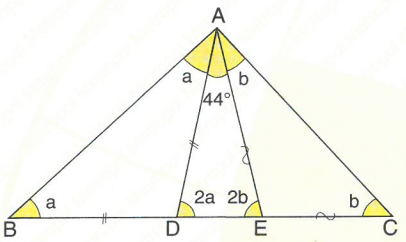
$m(\widehat{ACD}) = m(\widehat{CDE})$

$68° + 68° + x = 180°$

$136° + x = 180° \Rightarrow x = 44°$

**Yanıt / Answer E**

**8.**




$a + a + 44° + b + b = 180°$

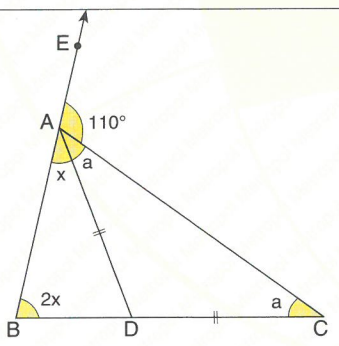
$2(a + b) = 136°$

$a + b = 68°$

$m(\widehat{BAC}) = 68° + 44° = 112°$

**Yanıt / Answer A**

**9.**




$2x + a = 110°$

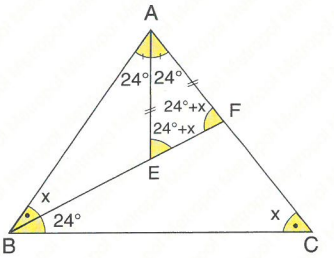
$x + a + 110° = 180°$

$x + a = 70°$

$$\begin{array}{r} 2x + a = 110° \\ - \quad x + a = 70° \\ \hline x = 40° \end{array}$$

**Yanıt / Answer B**

**10.**




$24° + 24° + x + 24° + x = 180°$

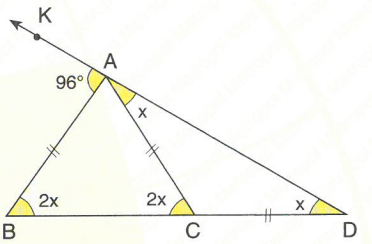
$72° + 2x = 180°$

$2x = 108°$

$x = 54°$

**Yanıt / Answer E**

**11.**




$m(\widehat{B}) + m(\widehat{D}) = m(\widehat{BAK})$

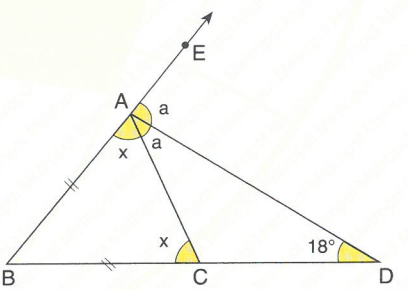
$2x + x = 96°$

$3x = 96°$

$x = 32°$

**Yanıt / Answer D**

**12.**




$a + 18° = x$

$x + 2a = (a + 18°) + 2a = 180°$

$3a + 18° = 180°$

$3a = 162°$

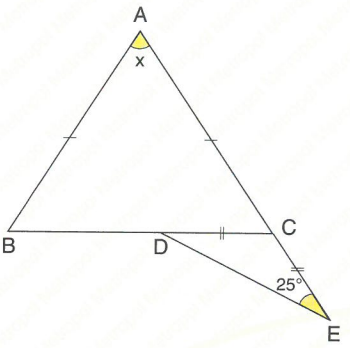
$a = 54°$

$x = a + 18°$

$x = 72°$

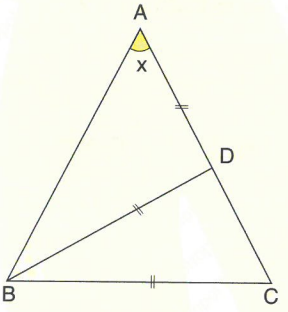
**Yanıt / Answer C**

**1.** |AB| = |AC|,
|DC| = |CE|,
$m(\widehat{CED}) = 25°$
$\Rightarrow$ **$m(\widehat{BAC}) = ?$**



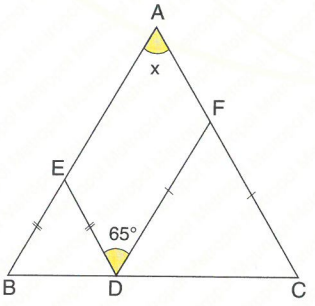

A) 72° B) 75° C) 80° D) 85° E) 84°

**2.** |AB| = |AC|,
|AD| = |BD| = |BC|
$\Rightarrow$ **$m(\widehat{BAC}) = x = ?$**



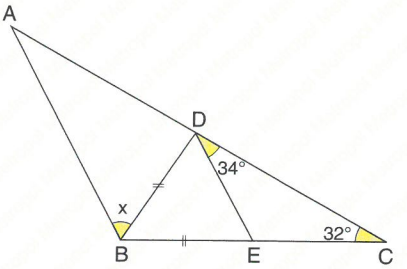

A) 30° B) 34° C) 36° D) 40° E) 44°

**3.** |EB| = |ED|,
|FD| = |FC|,
$m(\widehat{EDC}) = 65°$
$\Rightarrow$ **$m(\widehat{BAC}) = x = ?$**




A) 55° B) 60° C) 65° D) 70° E) 75°

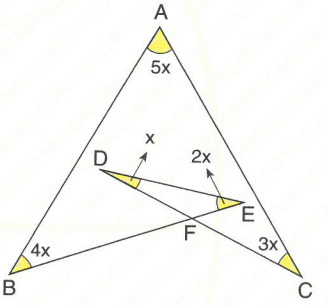
**4.**




|AB| = |BC|, |BD| = |BE|, $m(\widehat{EDC}) = 34°$,
$m(\widehat{DCE}) = 32°$ $\Rightarrow$ **$m(\widehat{ABD}) = x = ?$**

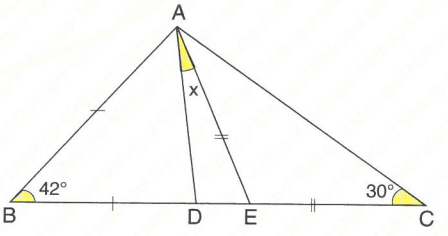
A) 58° B) 64° C) 66° D) 68° E) 70°

**5.** $m(\widehat{EDC}) = x$,
$m(\widehat{DEF}) = 2x$,
$m(\widehat{ACD}) = 3x$,
$m(\widehat{ABE}) = 4x$,
$m(\widehat{BAC}) = 5x$
$\Rightarrow$ **$x = ?$**




A) 10° B) 12° C) 18° D) 20° E) 24°

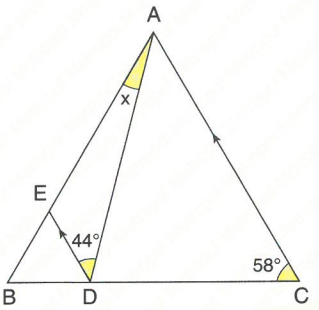
**6.**




|AB| = |BD|, |AE| = |EC|, $m(\widehat{ABD}) = 42°$,
$m(\widehat{ACE}) = 30°$ $\Rightarrow$ **$m(\widehat{DAE}) = x = ?$**

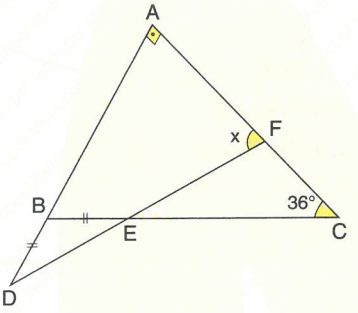
A) 5° B) 6° C) 7° D) 8° E) 9°

**7.** IABI = IACI,
m(ACB) = 58°,
m(EDA)= 44°
⇒ **m(EDA) = x = ?**



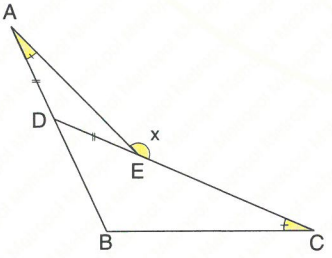

A) 15° B) 18° C) 20° D) 24° E) 30°

**8.** IBDI = IBEI,
[DA] ⊥ [AC],
m(ACB) = 36°
⇒ **m(AFE)= x = ?**




A) 63° B) 64° C) 68° D) 72° E) 76°

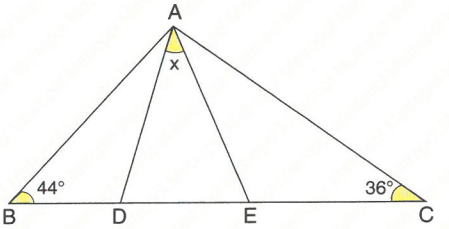
**9.**




m(DAE) = m(DCB), IADI = IDEI,
3·m(DCB) = m(CBA) ⇒ **m(AEC) = x = ?**

A) 120° B) 130° C) 140° D) 150° E) 160°

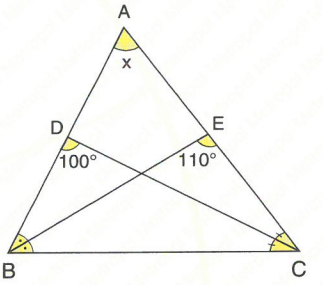
**10.**




IBEI = IABI, IACI = ICDI, m(ABE) = 44°,
m(ACD) = 36° ⇒ **m(DAE)= x = ?**

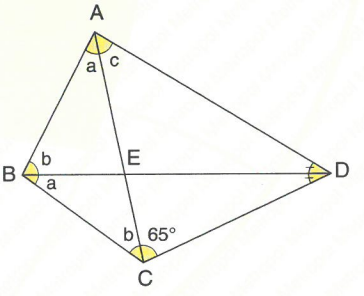
A) 35° B) 40° C) 46° D) 48° E) 52°

**11.** m(ABE) = m(EBC),
m(ACD) = m(DCB),
m(AEB) = 70°,
m(BDC)= 100°
⇒ **m(BAC) = x = ?**




A) 60° B) 65° C) 70° D) 75° E) 80°

**12.**



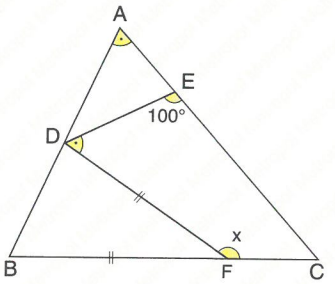

m(BAE) = m(EBC) = a, m(ABE) = m(ACB) = b,
m(ADE) = m(EDC), m(CAD) = c,
m(ACD) = 65° ⇒ **a + b + c = ?**

A) 140° B) 145° C) 150° D) 155° E) 160°

**YANITLAR / ANSWERS**

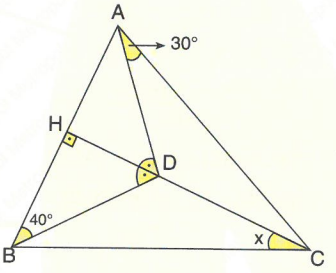
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | C | C | D | B | E | C | A | D | B | E | D |

1. IDFI = IBFI,
$m(\widehat{DAE}) = m(\widehat{EDF})$,
$m(\widehat{DEC}) = 100°$
$\Rightarrow$ **$m(\widehat{DFC}) = x = ?$**



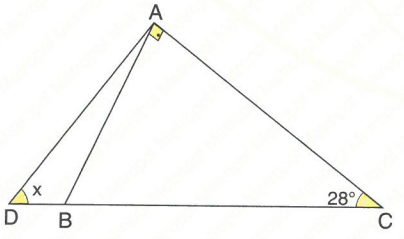

A) 140° B) 145° C) 150° D) 155° E) 160°

2. [AB] ⊥ [CH],
$m(\widehat{ADH}) = m(\widehat{HDB})$,
$m(\widehat{DAC}) = 30°$
$m(\widehat{HDB}) = 40°$
$\Rightarrow$ **$m(\widehat{HCB}) = x = ?$**




A) 15° B) 20° C) 25° D) 30° E) 40°

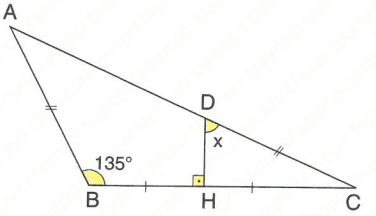
3.




[BA] ⊥ [AC], 2·IADI = IBCI, $m(\widehat{ACD}) = 28°$,
$\Rightarrow$ **$m(\widehat{ADC}) = ?$**

A) 28° B) 36° C) 46° D) 48° E) 56°

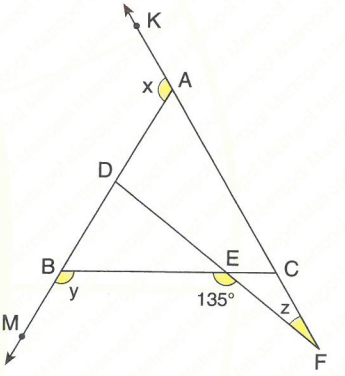
4.




[DH] ⊥ [BC], IABI = IDCI, IBHI = IHCI, $m(\widehat{ABC}) = 135°$
$\Rightarrow$ **$m(\widehat{HDC}) = x = ?$**

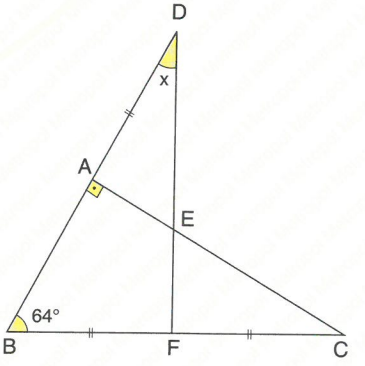
A) 55° B) 60° C) 65° D) 70° E) 75°

5. $m(\widehat{KAB}) = x$,
$m(\widehat{MBC}) = y$,
$m(\widehat{DFA}) = z$,
$m(\widehat{BEF}) = 135°$
$\Rightarrow$ **$x + y - z = ?$**



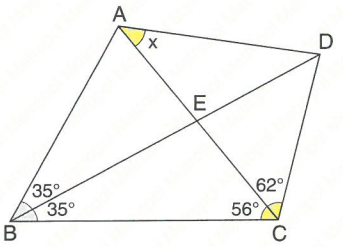

A) 225° B) 230° C) 235° D) 240° E) 245°

6. [AB] ⊥ [AC],
IADI = IBFI = IFCI,
$m(\widehat{ABC}) = 64°$
$\Rightarrow$ **$m(\widehat{BDF}) = x = ?$**




A) 32° B) 36° C) 42° D) 48° E) 52°

7.




$m(\widehat{ABD}) = m(\widehat{DBC}) = 35°$, $m(\widehat{ACB}) = 56°$,

$m(\widehat{ACD}) = 62° \Rightarrow$ **$m(\widehat{CAD}) = x = ?$**

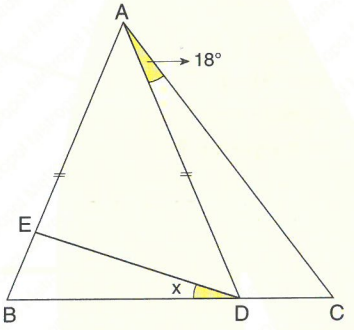
A) 60° B) 63° C) 64° D) 68° E) 72°

8. $|AB| = |AC|$,

$|AE| = |AD|$,

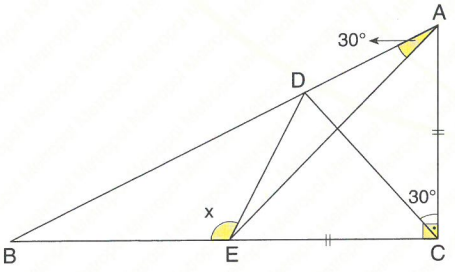
$m(\widehat{DAC}) = 18°$

$\Rightarrow$ **$m(\widehat{EDB}) = x = ?$**




A) 9° B) 12° C) 18° D) 24° E) 36°

9.




$[AC] \perp [BC]$, $|AC| = |EC|$, $m(\widehat{BAE}) = 30°$,

$m(\widehat{DCA}) = 30° \Rightarrow$ **$m(\widehat{DEB}) = x = ?$**

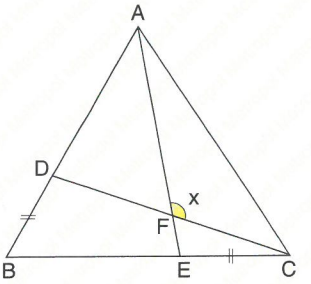
A) 105° B) 110° C) 115° D) 120° E) 125°



10. $|AB| = |AC| = |BC|$,

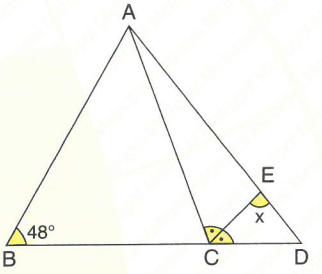
$|DB| = |EC|$

$\Rightarrow$ **$m(\widehat{AFC}) = x = ?$**




A) 110° B) 115° C) 120° D) 125° E) 130°

11.

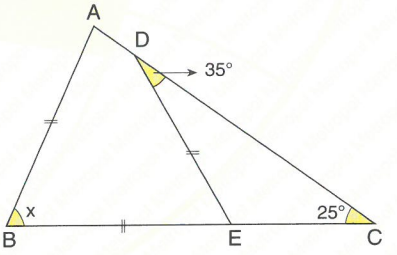



$|AB| = |BC| = |AD|$, $m(\widehat{ACE}) = m(\widehat{ECD})$,

$m(\widehat{ABC}) = 48° \Rightarrow$ **$m(\widehat{CED}) = x = ?$**

A) 54° B) 58° C) 66° D) 72° E) 75°

12.




$|AB| = |DE| = |BE|$, $m(\widehat{EDC}) = 35°$, $m(\widehat{DCE}) = 25°$

$\Rightarrow$ **$m(\widehat{ABC}) = ?$**

A) 60° B) 65° C) 70° D) 75° E) 80°

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | B | E | E | A | A | B | A | D | C | E | C |

# BÖLÜM CHAPTER 3

## TARİHSEL NOT / HISTORICAL NOTE

### Hypatia [370 – 415]

Doğu Roma İmparatorluğu'nun bir parçası olan İskenderiye'de yaşamış olan Helenistik bir Neoplatoncu filozof, astronom ve matematikçidir. Felsefe ve astronomi öğrettiği İskenderiye'deki Neoplatonik okulunun önemli bir düşünürüydü. Yaşamı oldukça iyi kaydedilmiş ilk kadın matematikçidir. Babası Theon'un yazdığı "Öklid'in Elementleri" adlı eser üzerine düzenleme yapmıştır.

She was a Hellenistic Neoplatonist philosopher, astronomer, and mathematician who lived in Alexandria, Egypt, then part of the Eastern Roman Empire. She was a prominent thinker of the Neoplatonic school in Alexandria, where she taught philosophy and astronomy. She is the first female mathematician whose life is reasonably well recorded. She also made arrangements on the book written by her father Theon, "The Elements of Euclid".

# ÜÇGENDE YARDIMCI ELEMANLAR
# THE AUXILIARY ELEMENTS in a TRIANGLE

**Bu bölüm 96 çözümlü test sorusu ve 72 test sorusu içermektedir.**

**This chapter includes 96 test questions with solutions and 72 test questions.**

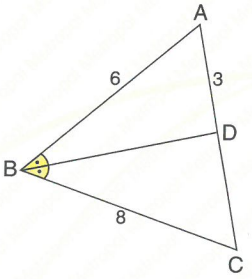
**BÖLÜM / CHAPTER 3**

**ÜÇGENDE YARDIMCI ELEMANLAR / THE AUXILIARY ELEMENTS in a TRIANGLE**

# ÜÇGENDE YARDIMCI ELEMANLAR
# THE AUXILIARY ELEMENTS in a TRIANGLE

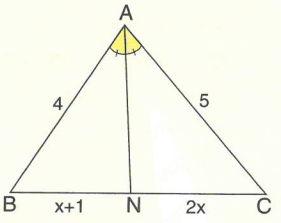


**1.** $m(\widehat{ABD}) = m(\widehat{DBC})$,
$|AB| = 6$ cm,
$|AD| = 3$ cm,
$|BC| = 8$ cm
$\Rightarrow$ **$|AC| = ?$ cm**



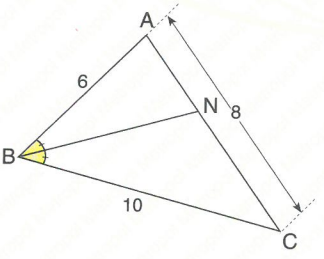

A) 6 B) 7 C) 8 D) 9 E) 10

**2.** $m(\widehat{BAN}) = m(\widehat{CAN})$,
$|AB| = 4$ cm,
$|AC| = 5$ cm,
$|BN| = (x + 1)$ cm
$|NC| = 2x$ cm
$\Rightarrow$ **$x = ?$ cm**



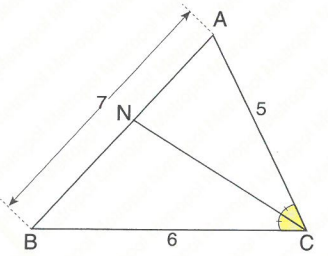

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) $\frac{5}{3}$ E) 2

**3.** $m(\widehat{ABN}) = m(\widehat{CBN})$,
$|AB| = 6$ cm,
$|BC| = 10$ cm,
$|AC| = 8$ cm
$\Rightarrow$ **$|NC| = ?$ cm**



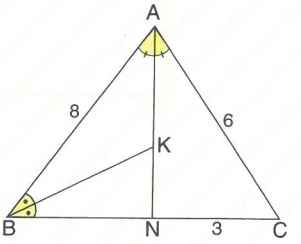

A) 4 B) 5 C) 5,5 D) 6 E) 6,5

**4.** $m(\widehat{ACN}) = m(\widehat{NCB})$
$|AC| = 5$ cm,
$|BC| = 6$ cm,
$|AB| = 7$ cm
$\Rightarrow$ **$|AN| = ?$ cm**



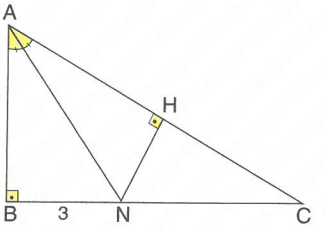

A) $\frac{35}{11}$ B) $\frac{11}{35}$ C) $\frac{25}{11}$ D) $\frac{11}{25}$ E) $\frac{3}{4}$

**5.** $m(\widehat{CAN}) = m(\widehat{NAB})$,
$m(\widehat{ABK}) = m(\widehat{NBK})$,
$|AB| = 8$ cm,
$|AC| = 6$ cm,
$|NC| = 3$ cm
$\Rightarrow$ **$|KN| = ?$ cm**



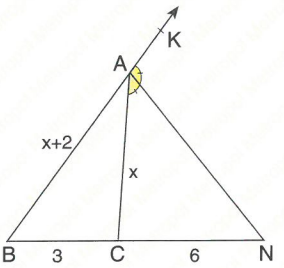

A) 1 B) 2 C) $\frac{5}{2}$ D) 3 E) $\frac{7}{2}$

**6.** $m(\widehat{BAN}) = m(\widehat{CAN})$,
$[AB] \perp [BC]$,
$[NH] \perp [AC]$,
$|BN| = 3$ cm
$\Rightarrow$ **$|NH| = ?$ cm**



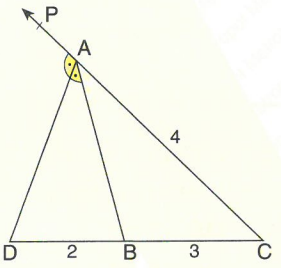

A) 2 B) 3 C) 3,5 D) 4 E) 6

**7.** $m(\widehat{KAN}) = m(\widehat{CAN})$,
$|AB| = (x + 2)$ cm,
$|BC| = 3$ cm,
$|CN| = 6$ cm,
$|AC| = x$ cm
$\Rightarrow$ **x = ? cm**



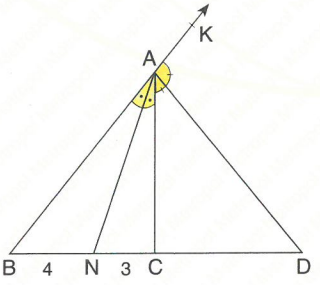

A) 2 B) 3 C) 4 D) 4,5 E) 5

**8.** $m(\widehat{PAD}) = m(\widehat{BAD})$,
$|DB| = 2$ cm,
$|BC| = 3$ cm,
$|AC| = 4$ cm
$\Rightarrow$ **|AB| = ? cm**



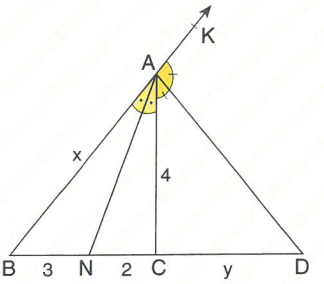

A) 1,6 B) 1,8 C) 2 D) 2,2 E) 2,4

**9.** [AN] iç açıortay,
[AD] dış açıortaydır.
[AN] is an interior bisector, [AD] is an exterior bisector.
$|BN| = 4$ cm,
$|NC| = 3$ cm
$\Rightarrow$ **|BD| = ? cm**




A) 21 B) 25 C) 26 D) 28 E) 30

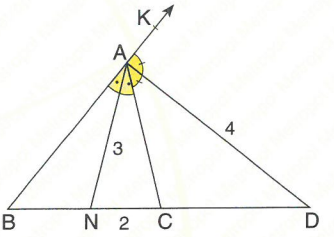
**10.** [AN] iç açıortay,
[AD] dış açıortaydır.
[AN] is an interior bisector, [AD] is an exterior bisector.
$|AC| = 4$ cm,
$|BN| = 3$ cm,
$|NC| = 2$ cm




$\Rightarrow$ **x + y = ? cm**

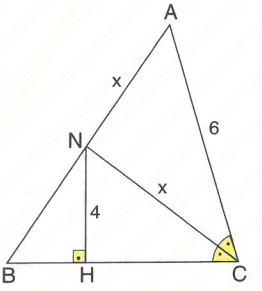
A) 12 B) 13 C) 14 D) 15 E) 16

**11.** [AN] iç açıortay,
[AD] dış açıortaydır.
[AN] is an interior bisector, [AD] is an exterior bisector.
$|AN| = 3$ cm,
$|NC| = 2$ cm,
$|AD| = 4$ cm $\Rightarrow$ **|BN| = ? cm**




A) 7 B) 8 C) 9 D) 10 E) 11

**12.** $m(\widehat{ACN}) = m(\widehat{BCN})$,
$[NH] \perp [BC]$,
$|AC| = 6$ cm,
$|NH| = 4$ cm
$\Rightarrow$ **|AN| = |NC| = x ? cm**

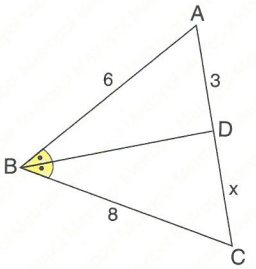



A) 4 B) 5 C) 5,5 D) 6 E) 7

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | D | B | A | B | B | C | A | A | E | D | B |

**1.**

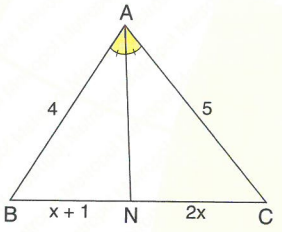



$m(\widehat{ABD}) = m(\widehat{DBC}) \Rightarrow \frac{|AB|}{|BC|} = \frac{|AD|}{|DC|}$

$\frac{6}{8} = \frac{3}{x} \Rightarrow x = 4,\ |AC| = 7\,cm$

**Yanıt / Answer B**

**2.**

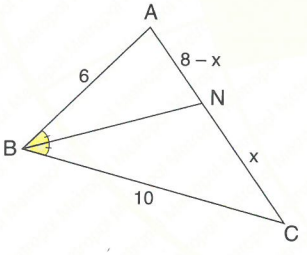



$m(\widehat{BAN}) = m(\widehat{NAC}) \Rightarrow \frac{|AC|}{|AB|} = \frac{|NC|}{|BN|}$

$\frac{5}{4} = \frac{2x}{x+1} \Rightarrow 8x = 5x + 5 \Rightarrow x = \frac{5}{3}\,cm$

**Yanıt / Answer D**

**3.**




$|NC| = x \Rightarrow |AN| = 8 - x$

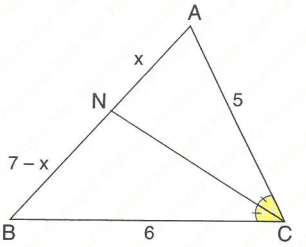
[BN] bir iç açıortaydır. / [BN] is an interior bisector.

$\frac{6}{10} = \frac{8-x}{x} \Rightarrow 6x = 80 - 10x$

$16x = 80 \Rightarrow x = 5\,cm$

**Yanıt / Answer B**

**4.**



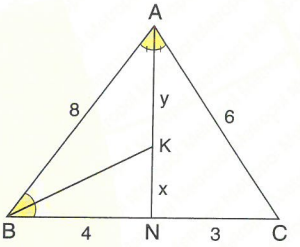

$|AN| = x \Rightarrow |NB| = 7 - x$

[NC] bir iç açıortaydır. / [NC] is an interior bisector.

$\frac{5}{6} = \frac{x}{7-x} \Rightarrow x = \frac{35}{11}\,cm$

**Yanıt / Answer A**

**5.**




$m(\widehat{BAN}) = m(\widehat{NAC}) \Rightarrow \frac{6}{8} = \frac{3}{|BN|} \Rightarrow |BN| = 4\,cm$

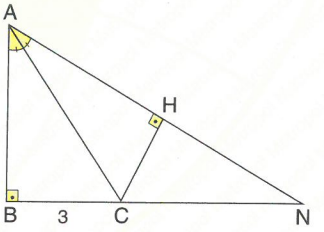
$m(\widehat{ABK}) = m(\widehat{KBN}) \Rightarrow \frac{8}{4} = \frac{y}{x} \Rightarrow y = 2x$

$|AN|^2 = 8 \cdot 6 - 4 \cdot 3 = 36 \Rightarrow |AN| = 6 \Rightarrow x + y = 6\,cm$

$x + 2x = 6 \Rightarrow x = 2\,cm$

**Yanıt / Answer B**

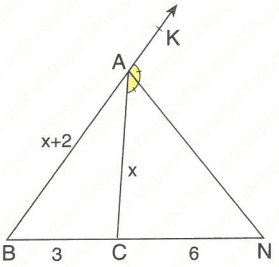
**6.**




$\left.\begin{array}{l} m(\widehat{BAD}) = m(\widehat{CAN}), \\ [AB] \perp [BC] \\ [NH] \perp [AH] \end{array}\right\} \Rightarrow |BN| = |NH| = 3\,cm$

**Yanıt / Answer B**

**7.**

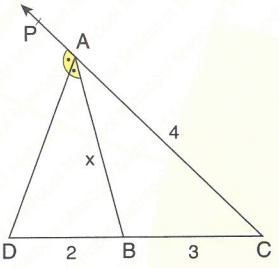



[AN] bir dış açıortaydır. / [AN] is an exterior bisector.

$\frac{|NC|}{|NB|} = \frac{|AC|}{|AB|} \Rightarrow \frac{6}{9} = \frac{x}{x+2} \Rightarrow x = 4\,cm$

**Yanıt / Answer C**

**8.**

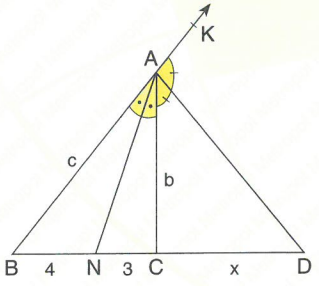



[AD] bir dış açıortaydır. / [AD] is an exterior bisector.

$\frac{|DB|}{|DC|} = \frac{|AB|}{|AC|} \Rightarrow \frac{2}{5} = \frac{x}{4} \Rightarrow x = \frac{8}{5} = 1,6\,cm$

**Yanıt / Answer A**

**9.**




[AN] bir iç açıortaydır. / [AN] is a interior bisector.

[AD] bir dış açıortaydır. / [AD] is a exterior bisector.

$\left.\begin{array}{l} \frac{b}{c} = \frac{3}{4} \\ \frac{b}{c} = \frac{|DC|}{|DC|+7} \end{array}\right\} \Rightarrow \frac{3}{4} = \frac{x}{x+7} \Rightarrow x = 21\,cm$

**Yanıt / Answer A**

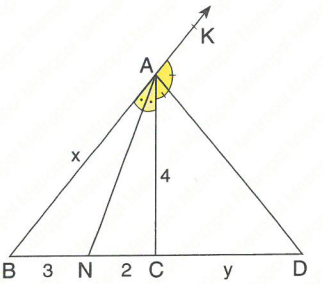
**10.** [AN] bir iç açıortaydır.

[AN] is an interior bisector.

$\frac{4}{x} = \frac{2}{3} \Rightarrow x = 6\,cm$

[AD] bir dış açıortaydır.

[AD] is an exterior bisector.

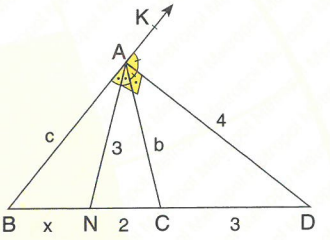



$\frac{y}{y+5} = \frac{4}{x} \Rightarrow \frac{y}{y+5} = \frac{4}{6} \Rightarrow y = 10\,cm$

$x + y = 6 + 10 = 16\,cm$

**Yanıt / Answer E**

**11.**




[AN] bir iç açıortay, [AD] bir dış açıortaydır.

[AN] is an interior bisector, [AD] is an exterior bisector.

$m(\widehat{NAC}) + m(\widehat{CAD}) = 90°$

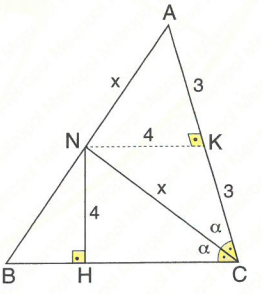
$|ND|^2 = |AN|^2 + |AD|^2$ [*Pisagor* / Pythagor ]

$|ND|^2 = 3^2 + 4^2$

$|ND| = 5\,cm \Rightarrow |CD| = 3\,cm$

**Yanıt / Answer D**

**12.**



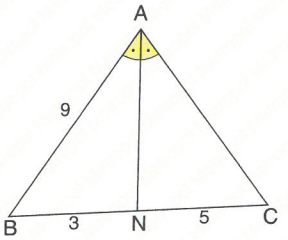

$\left.\begin{array}{l} [CN] \text{ açıortay / bisector} \\ [NK] \perp [AC] \end{array}\right\} \Rightarrow$

$|AK| = |KC| = 3\,cm,\ |NH| = |NK| = 4\,cm$

$x^2 = 3^2 + 4^2 \Rightarrow x = 5\,cm$

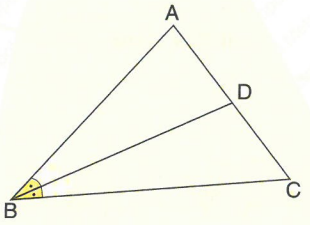
**Yanıt / Answer B**

**1.** $m(\widehat{BAN}) = m(\widehat{NAC})$,
$|BN| = 3$ cm,
$|NC| = 5$ cm,
$|AB| = 12$ cm
$\Rightarrow$ **$|AC| = ?$ cm**



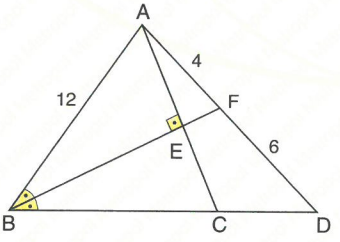

A) 10 B) 12 C) 15 D) 18 E) 20

**2.** $m(\widehat{ABD}) = m(\widehat{CBD})$,
$2|AD| = 3|DC|$,
$|AB| = (x + 2)$ cm,
$|BC| = (x - 1)$ cm
$\Rightarrow$ **$x = ?$ cm**



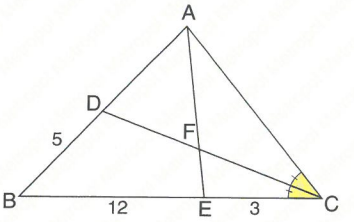

A) 7 B) 6 C) 5 D) 4 E) 3

**3.** $m(\widehat{ABF}) = m(\widehat{FBD})$,
$[AC] \perp [BF]$,
$|AB| = 12$ cm,
$|AF| = 4$ cm,
$|FD| = 6$ cm
$\Rightarrow$ **$|CD| = ?$ cm**



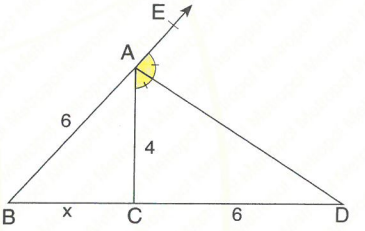

A) 3 B) 4 C) 5 D) 6 E) 8

**4.** $m(\widehat{ACD}) = m(\widehat{BCD})$,
$3 \cdot |FE| = |AF|$,
$|EC| = 3$ cm,
$|BE| = 12$ cm,
$|BD| = 5$ cm
$\Rightarrow$ **$|AD| = ?$ cm**



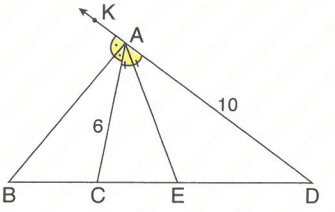

A) 6 B) 5 C) 4 D) 3 E) 2

**5.** $m(\widehat{EAD}) = m(\widehat{CAD})$,
$|AB| = 6$ cm,
$|AC| = 4$ cm,
$|CD| = 6$ cm
$\Rightarrow$ **$|BC| = x = ?$ cm**



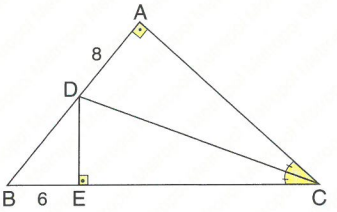

A) 5 B) 4 C) 3 D) 2 E) 1

**6.** $m(\widehat{KAB}) = m(\widehat{CAB})$,
$m(\widehat{CAE}) = m(\widehat{DAE})$,
$|AC| = 6$ cm,
$|AD| = 10$ cm,
**$|CD| = 8$ cm**
$\Rightarrow$ **$|BE| = ?$ cm**



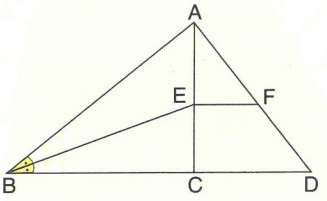

A) 9 B) 10 C) 11 D) 12 E) 15

**7.** $m(\widehat{ACD}) = m(\widehat{BCD})$,
$[BA] \perp [CA]$,
$[DE] \perp [BC]$,
$|AD| = 8$ cm,
$|BE| = 6$ cm
$\Rightarrow$ **$|AC| = ?$ cm**



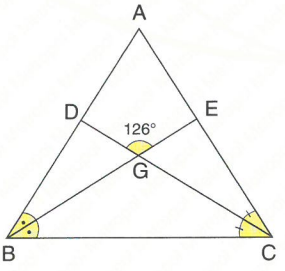

A) 24 B) 22 C) 20 D) 18 E) 16

**8.** $m(\widehat{ABE}) = m(\widehat{DBE})$,
$|AE| = |EC|$,
$|AB| = 18$ cm,
$|BD| = 26$ cm,
$EF \parallel BD$
$\Rightarrow$ **$|EF| = ?$ cm**



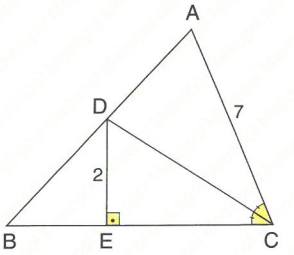

A) 5 B) 4 C) 3 D) 2 E) 1

**9.** $m(\widehat{ABE}) = m(\widehat{EBC})$,
$m(\widehat{ACD}) = m(\widehat{DCB})$,
$m(\widehat{DGE}) = 126°$
$\Rightarrow$ **$m(\widehat{BAC}) = ?$**



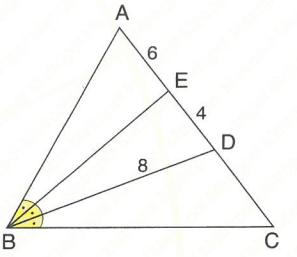

A) 64° B) 72° C) 80° D) 88° E) 96°

**10.** $[DE] \perp [BC]$,
$m(\widehat{ACD}) = m(\widehat{DCE})$,
$|DE| = 2$ cm,
$|EC| = 6$ cm,
$|AC| = 7$ cm
$\Rightarrow$ **$|AD| = ?$ cm**



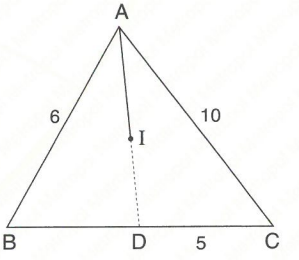

A) 1 B) 2 C) $\sqrt{3}$ D) $\sqrt{5}$ E) $\sqrt{6}$

**11.** $m(\widehat{ABE}) = m(\widehat{EBD}) = m(\widehat{DBC})$,
$|AE| = 6$ cm,
$|ED| = 4$ cm,
$|BD| = 8$ cm
$\Rightarrow$ **$|DC| = ?$ cm**




A) $\frac{30}{7}$ B) $\frac{32}{7}$ C) $\frac{34}{7}$ D) $\frac{36}{7}$ E) $\frac{38}{7}$

**12.** I noktası iç teğet çemberin merkezidir.
Point I is center of the interior tangent.
$|AB| = 6$ cm,
$|AC| = 10$ cm,
$|DC| = 5$ cm
$\Rightarrow$ **$|AI| = ?$ cm**

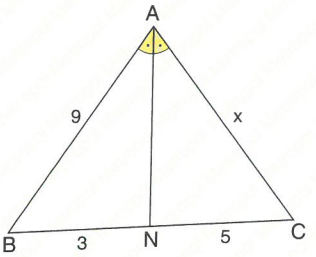



A) $\sqrt{5}$ B) $2\sqrt{5}$ C) $3\sqrt{5}$ D) 4 E) 5

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | A | D | D | C | E | A | B | B | D | B | B |

1.



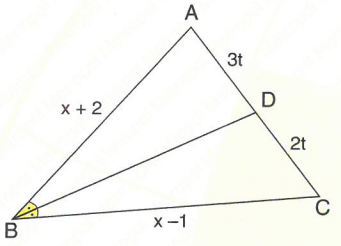

[AN] bir iç açıortaydır. / [AN] is an interior bisector.

$\frac{|AC|}{|AB|} = \frac{|NC|}{|BN|}$

$\frac{x}{9} = \frac{5}{3} \Rightarrow 3x = 45 \Rightarrow x = 15\,cm$

**Yanıt / Answer C**

2.



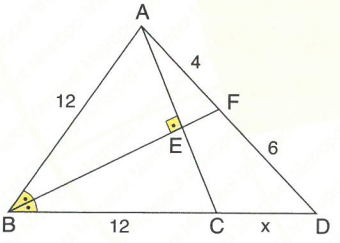

[BD] bir iç açıortaydır. / [BD] is an interior bisector.

$\frac{|AB|}{|BC|} = \frac{|AD|}{|DC|}$

$\frac{x+2}{x-1} = \frac{3t}{2t} \Rightarrow 2x + 4 = 3x - 3 \Rightarrow x = 7\,cm$

**Yanıt / Answer A**

3.




$\left.\begin{array}{l} m(\widehat{ABE}) = m(\widehat{EBC}) \\ [AC] \perp [BE] \end{array}\right\} \Rightarrow |AB| = |BC| = 12\,cm$

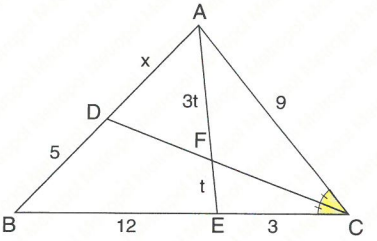
[BF] bir iç açıortaydır. / [BD] is an interior bisector.

$\frac{|AB|}{|BD|} = \frac{|AF|}{|FD|} \Rightarrow \frac{12}{12+x} = \frac{4}{6}$

$12 + x = 18 \Rightarrow x = 6\,cm$

**Yanıt / Answer D**

4.



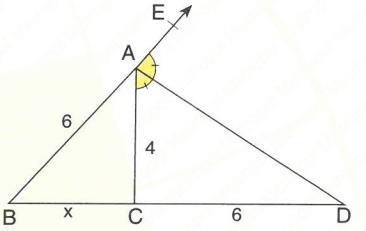

[DC] bir iç açıortaydır. / [DC] is an interior bisector.

$\frac{|AC|}{|EC|} = \frac{3t}{t} \Rightarrow |AC| = 9\,cm$

$\frac{|AC|}{|BC|} = \frac{|AD|}{|DB|} \Rightarrow \frac{9}{15} = \frac{x}{5} \Rightarrow x = 3\,cm$

**Yanıt / Answer D**

5.

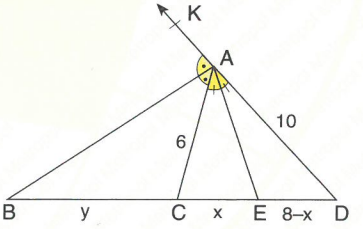



[AD] bir dış açıortaydır. / [AD] is an exterior bisector.

$\frac{|DC|}{|DB|} = \frac{|AC|}{|AB|} \Rightarrow \frac{6}{6+x} = \frac{4}{6} \Rightarrow x = 3\,cm$

**Yanıt / Answer C**

6.



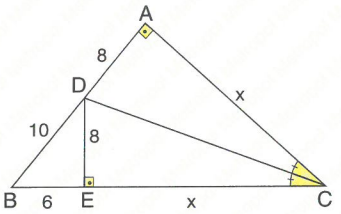

[AE] bir iç açıortay, [AB] bir dış açıortaydır.

[AE] is an interior bisector and [AB] is an exterior bisector.

$\left.\begin{array}{l} \frac{10}{6} = \frac{8-x}{x} \Rightarrow x = 3\,cm \\ \frac{y}{y+8} = \frac{6}{10} \Rightarrow y = 12\,cm \end{array}\right\} \Rightarrow |BE| = x + y = 15\,cm$

**Yanıt / Answer E**

**7.**




$$\left.\begin{array}{l} m(\widehat{ACD}) = (\widehat{DCB}) \\ m(\widehat{A}) = m(\widehat{E}) = 90^\circ \end{array}\right\} \Rightarrow |AC| = |EC| = x$$

$|DE| = |AD| = 8\,cm$

$|DB| = \sqrt{8^2 + 6^2}$ [Pythaor]

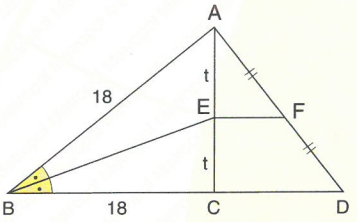
$|DB| = 10\,cm$

[DC] bir iç açıortaydır. / [DC] is an interior bisector.

$\frac{8}{10} = \frac{x}{6+x} \Rightarrow x = 24\,cm$

**Yanıt / Answer A**

**8.**



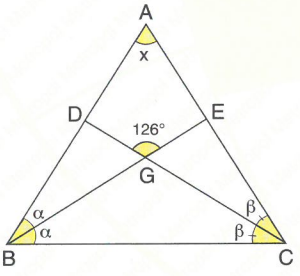

$$\left.\begin{array}{l} m(\widehat{ABE}) = m(\widehat{EBC}) \\ |AE| = |EC| \end{array}\right\} \Rightarrow |AB| = |BC| = 18\,cm$$

$|DC| = 26 - 18 = 8\,cm$

$|EF| = \frac{|DC|}{2} = \frac{8}{2} = 4\,cm$

**Yanıt / Answer B**

**9.**

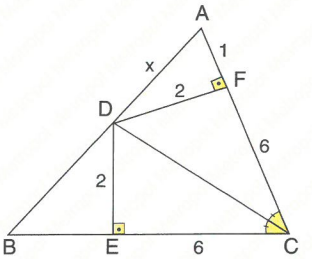



$m(\widehat{BGC}) = 90^\circ + \frac{m(\widehat{A})}{2}$

$126^\circ = 90^\circ + \frac{x}{2} \Rightarrow \frac{x}{2} = 36^\circ \Rightarrow x = 72^\circ$

**Yanıt / Answer B**

**10.**



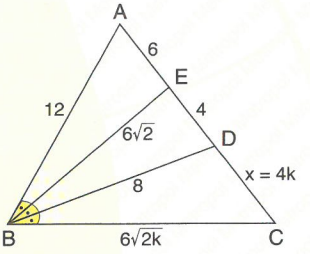

$D\hat{E}C \sim D\hat{F}C \Rightarrow |DF| = 2\,cm,\ |CF| = 6\,cm \Rightarrow |AF| = 1\,cm$

$x^2 = 1^2 + 2^2$ [Pythagor]

$x = \sqrt{5}\,cm$

**Yanıt / Answer D**

**11.**




$m(\widehat{ABE}) = m(\widehat{EBD}) \Rightarrow$

$\frac{|AB|}{|BD|} = \frac{6}{4} \Rightarrow |AB| = 12\,cm$

$|BE|^2 = 12 \cdot 8 - 6 \cdot 4 \Rightarrow |BE| = 6\sqrt{2}\,cm$

$m(\widehat{EBD}) = m(\widehat{DBC}) \Rightarrow$

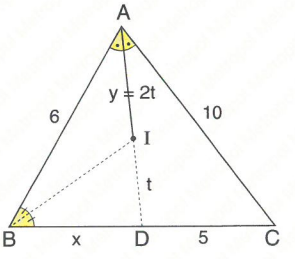
$\frac{6\sqrt{2}}{|BC|} = \frac{4}{|DC|} \Rightarrow |BC| = 6\sqrt{2}k,\ |DC| = 4k$

$8^2 = 6\sqrt{2} \cdot 6\sqrt{2}k - 4 \cdot 4k$

$k = \frac{8}{7} \Rightarrow |DC| = x = 4k = 4 \cdot \frac{8}{7} = \frac{32}{7}\,cm$

**Yanıt / Answer B**

**12.**




$m(\widehat{BAI}) = m(\widehat{IAC}) \Rightarrow$

$\frac{10}{6} = \frac{5}{x} \Rightarrow x = 3\,cm$

$m(\widehat{ABI}) = m(\widehat{IBD}) \Rightarrow$

$\frac{y}{t} = \frac{6}{3} \Rightarrow y = 2t$

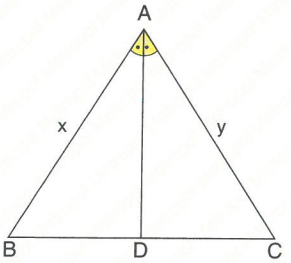
$|AD|^2 = 10 \cdot 6 - 5 \cdot 3 = 45$

$|AD| = 3\sqrt{5}\,cm$

$|AD| = 3t = 3\sqrt{5} \Rightarrow |AI| = 2t = 2\sqrt{5}\,cm$

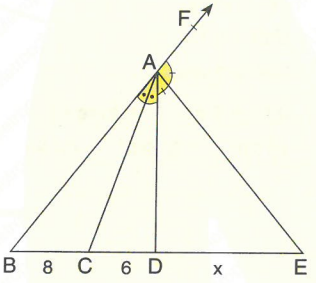
**Yanıt / Answer B**

**1.** $m(\widehat{BAD}) = m(\widehat{DAC})$,
$|BC| = 24$ cm,
$|AB| = x$ cm,
$|AC| = y$ cm,
$\frac{x+y}{x} = 3$
$\Rightarrow$ **$|BD| = ?$ cm**



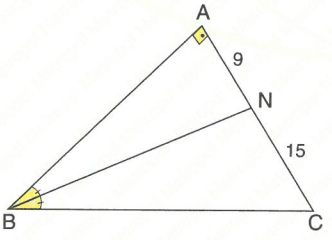

A) 4 B) 8 C) 12 D) 16 E) 20

**2.** [AC] bir iç açıortay,
[AE] bir dış açıortaydır.
[AC] is an interior bisector, [AE] is an exterior bisector.
$m(\widehat{BAC}) = m(\widehat{CAD})$,
$m(\widehat{FAE}) = m(\widehat{EAD})$,
$|BC| = 8$ cm,
$|CD| = 6$ cm
$\Rightarrow$ **$|DE| = x = ?$ cm**



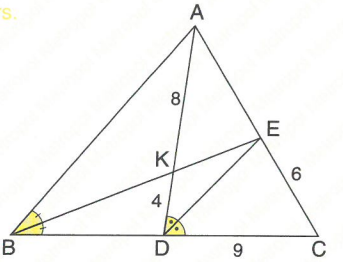

A) 32 B) 36 C) 38 D) 40 E) 42

**3.** $[BA] \perp [CA]$,
$m(\widehat{ABN}) = m(\widehat{NBC})$,
$|AN| = 9$ cm,
$|NC| = 15$ cm
$\Rightarrow$ **$|AB| = ?$ cm**



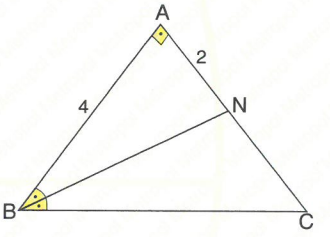

A) 16 B) 17 C) 18 D) 19 E) 20

**4.** [BE] ve [DE] birer açıortaydır.
[BE] and [DE] are bisectors.
$m(\widehat{ABE}) = m(\widehat{EBC})$,
$m(\widehat{ADE}) = m(\widehat{EDC})$,
$|AK| = 8$ cm,
$|KD| = 4$ cm,
$|EC| = 6$ cm,
$|DC| = 9$ cm
$\Rightarrow$ **$|AB| = ?$ cm**



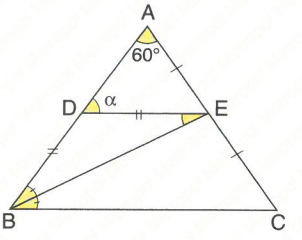

A) 18 B) 24 C) 30 D) 36 E) 40

**5.** $m(\widehat{ABN}) = m(\widehat{CBN})$,
$[AB] \perp [AC]$,
$|AB| = 4$ cm,
$|AN| = 2$ cm
$\Rightarrow$ **$|NC| = ?$ cm**




A) 1 B) $\frac{3}{2}$ C) 2 D) 3 E) $\frac{10}{3}$

**6.** [BE] bir açıortaydır.
[BE] is a bisector.
$m(\widehat{ABE}) = m(\widehat{EBC})$,
$|AE| = |EC|$
$|BD| = |ED|$
$m(\widehat{BAC}) = 60°$
$\Rightarrow$ **$m(\widehat{ADE}) = \alpha = ?$**




A) 45 B) 50 C) 55 D) 60 E) 70

**7.** $m(\widehat{CAD}) = m(\widehat{DAF})$,

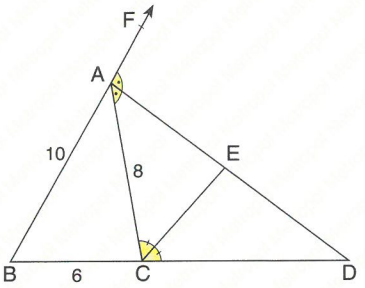
$m(\widehat{ECD}) = m(\widehat{ACE})$,

$|AB| = 10$ cm,

$|AC| = 8$ cm,

$|BC| = 6$ cm

$\Rightarrow \dfrac{|ED|}{|EA|} = ?$




A) 1 B) $\frac{3}{2}$ C) 2 D) $\frac{5}{2}$ E) 3

**8.** [DE] ve [CD] birer açıortaydır.

[DE] and [CD] are bisectors.

$m(\widehat{BDE}) = m(\widehat{EDC})$,

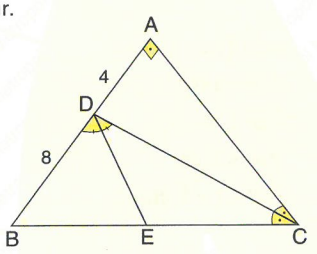
$m(\widehat{ACD}) = m(\widehat{DCB})$,

$[BA] \perp [CA]$,

$|AD| = 4$ cm,

$|DB| = 8$ cm

$\Rightarrow$ **$|EC| = ?$ cm**




A) 4 B) $4\sqrt{3}$ C) 8 D) $8\sqrt{3}$ E) 10

**9.** $m(\widehat{BAD}) = m(\widehat{DAC})$,

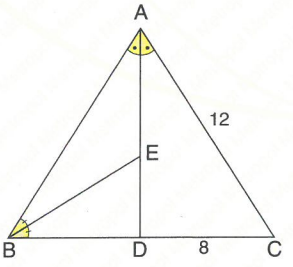
$m(\widehat{ABE}) = m(\widehat{EBD})$,

$|AC| = 12$ cm,

$|AD| = 10$ cm,

$|DC| = 8$ cm

$\Rightarrow$ **$|BE| = ?$ cm**




A) $3\sqrt{14}$ B) $3\sqrt{7}$ C) 3 D) $3\sqrt{21}$ E) $\sqrt{42}$

**10.** [AD bir açıortaydır. / [AD] is a bisector.

$m(\widehat{BAD}) = m(\widehat{DAC})$,

$|AC| = 9$ cm,

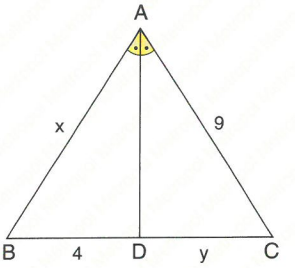
$|BD| = 4$ cm,

$|AB| = x$ cm,

$|DC| = y$ cm,

$x^2 + y^2 = 72$ cm$^2$

$\Rightarrow$ **$x = ?$ cm**




A) 4 B) 6 C) 8 D) 10 E) 12

**11.** I noktası iç teğet çemberinin merkezidir.

The point I is center of the innercircle tangent.

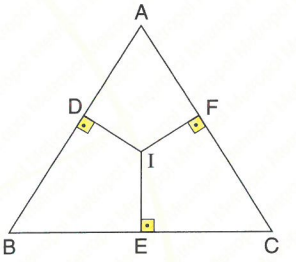
$[ID] \perp [AB]$, $[IE] \perp [BC]$,

$[IF] \perp [AC]$,

$|AB| = 9$ cm,

$|AF| = 3$ cm

$|FC| = 7$ cm $\Rightarrow$ **Çevre /** The perimeter **$(\overset{\triangle}{ABC}) = ?$ cm**




A) 20 B) 24 C) 28 D) 32 E) 36

**12.** I noktası iç teğet çemberinin merkezidir.

The point I is center of the innercircle tangent.

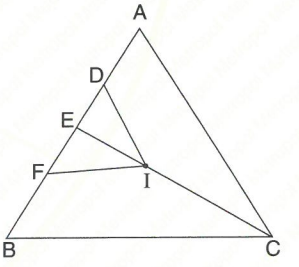
$[DI] \parallel [AC]$, $[FI] \parallel [BC]$,

$|AC| = 16$ cm,

$|BC| = 10$ cm,

$|CI| = 2 \cdot |IE|$

$\Rightarrow$ **Çevre /** The perimeter **$(\overset{\triangle}{IDF}) = ?$ cm**

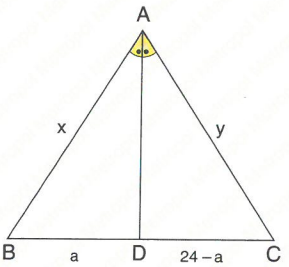



A) 13 B) 14 C) 15 D) 16 E) 18

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | E | C | D | E | D | E | B | A | B | D | A |

1.




$\frac{x+y}{x} = 3 \Rightarrow y = 2x$

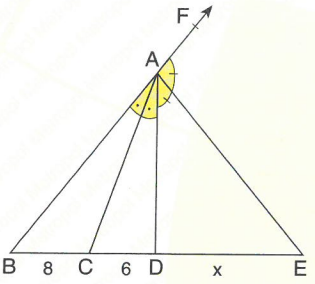
$m(\widehat{BAD}) = m(\widehat{DAC}) \Rightarrow \frac{|AB|}{|AC|} = \frac{|BD|}{|DC|} \Rightarrow$

$\frac{x}{y} = \frac{a}{24-a} \Rightarrow \frac{x}{2x} = \frac{a}{24-a}$

$24 - a = 2a \Rightarrow a = 8$ cm

**Yanıt / Answer B**

2.




[AC] bir iç açıortay, [AE] bir dış açıortaydır.

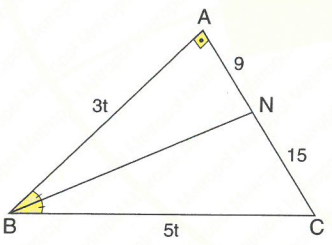
[AC] is an interior bisector, [AE] is an exterior bisector.

$\frac{x}{x+14} = \frac{6}{8}$

$8x = 6x + 6 \cdot 14 \Rightarrow x = 42$ cm

**Yanıt / Answer E**

3.




[BN] bir açıortaydır. / [BN] is a bisector.

$\frac{|AB|}{|BC|} = \frac{9}{15} = \frac{3}{5}$

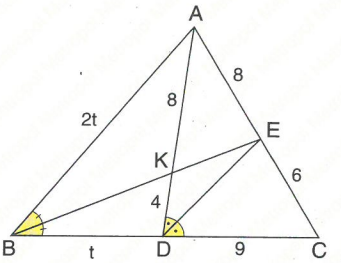
$(5t)^2 = (3t)^2 + 24^2$ [ Pythagor ]

$16t^2 = 24^2 \Rightarrow 4t = 24 \Rightarrow t = 6$ cm

$|AB| = 18$ cm

**Yanıt / Answer C**

4.




[DE] bir açıortaydır. / [DE] is a bisector.

$\frac{|AD|}{|DC|} = \frac{|AE|}{|EC|} \Rightarrow \frac{12}{9} = \frac{|AE|}{6} \Rightarrow |AE| = 8$ cm

[BK] bir açıortaydır. / [BK] is a bisector.

$\frac{|AB|}{|BD|} = \frac{8}{4} \Rightarrow |AB| = 2 \cdot |BD|,$

$m(\widehat{ABE}) = m(\widehat{EBC})$

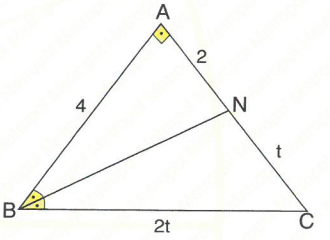
$\frac{|AB|}{|BC|} = \frac{|AE|}{|EC|} = \frac{8}{6} \Rightarrow \frac{2t}{t+9} = \frac{8}{6}$

$12t = 8t + 72 \Rightarrow t = 18 \Rightarrow |AB| = 36$ cm

**Yanıt / Answer D**

5. [BN] bir açıortaydır.

[BN] is a bisector.




$\frac{|AB|}{|BC|} = \frac{|AN|}{|NC|}$

$\frac{4}{|BC|} = \frac{2}{|NC|}$

$|BC| = 2t$, $|NC| = t$

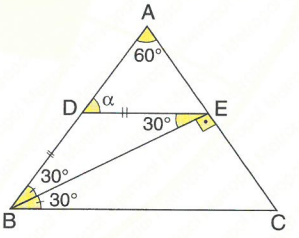
$(2t)^2 = (t+2)^2 + 4^2$

$3t^2 - 4t - 20 = 0 \Rightarrow (3t-10) \cdot (t+2) = 0$

$t = \frac{10}{3} \Rightarrow |NC| = \frac{10}{3}$ cm

**Yanıt / Answer E**

6.




$\left.\begin{array}{l} m(\widehat{ABE}) = m(\widehat{EBC}) \\ |AE| = |EC| \end{array}\right\} \Rightarrow$ AEB bir dik üçgendir.

AEB is a right triangle.

$\alpha = 30° + 30° \Rightarrow \alpha = 60°$

**Yanıt / Answer D**

**7.** [AD bir dış açıortaydır.

[AD] is an exterior bisector.

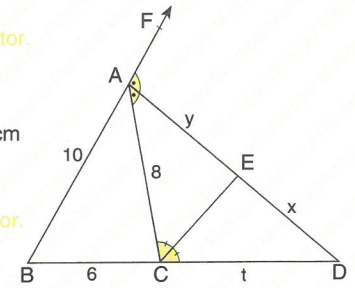
$\frac{t}{t+6} = \frac{8}{10}$

$10t = 8t + 48 \Rightarrow t = 24$ cm

[CE bir iç açıortaydır.

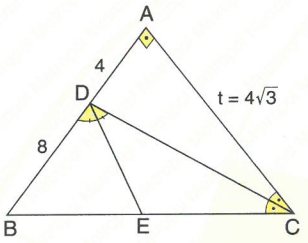
[CE] is an interior bisector.

$\frac{|ED|}{|EA|} = \frac{x}{y} = \frac{t}{8} = \frac{24}{8} = 3$




**Yanıt / Answer E**

**8.**




$\frac{|AC|}{|BC|} = \frac{|AD|}{|DB|} = \frac{4}{8} \Rightarrow \begin{cases} |AC| = t \\ |BC| = 2t \end{cases}$

$(2t)^2 = t^2 + 12^2$ [Pisagor / Pythagor]

$3t^2 = 12^2 \Rightarrow t = 4\sqrt{3}$ cm

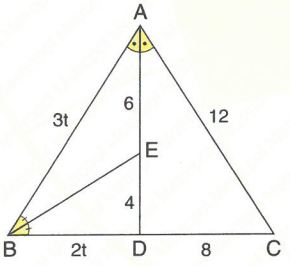
$|DC|^2 = (4\sqrt{3}) \cdot (8\sqrt{3}) - 8 \cdot 4$, $|DC| = 8$ cm

$\frac{|BD|}{|DC|} = \frac{|BE|}{|EC|} \Rightarrow \frac{8}{8} = \frac{|BE|}{|EC|} \Rightarrow |BE| = |EC| = t$

$\Rightarrow |EC| = 4\sqrt{3}$ cm

**Yanıt / Answer B**

**9.**




$\frac{|AE|}{|ED|} = \frac{|AB|}{|BD|} = \frac{|AC|}{|DC|} = \frac{12}{8} \Rightarrow$

$\left.\begin{array}{l} \frac{|AE|}{|ED|} = \frac{3}{2} \\ |AE| + |ED| = 10 \end{array}\right\} \Rightarrow \begin{array}{l} |AE| = 6 \text{ cm} \\ |ED| = 4 \text{ cm} \end{array}$

$|AD|^2 = 12 \cdot 3t - 8 \cdot 2t \Rightarrow 100 = 20t \Rightarrow t = 5$ cm

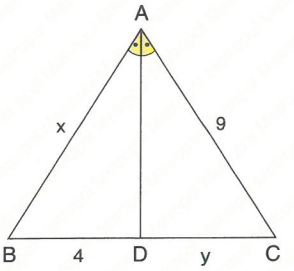
$|AB| = 15$ cm, $|BD| = 10$ cm

$|BE|^2 = (15) \cdot (10) - 6 \cdot 4$

$|BE|^2 = 126 \Rightarrow |BE| = 3\sqrt{14}$ cm

**Yanıt / Answer A**

**10.**




$x^2 + y^2 = 72\,\text{cm}^2$

[AD] bir açıortaydır. / [AD is a bisector] $\Rightarrow$

$\frac{9}{x} = \frac{y}{4} \Rightarrow xy = 36$

$(x+y)^2 = x^2 + y^2 + 2xy$

$x + y = 2$ cm ve (and) $xy = 36\ \text{cm}^2 \Rightarrow x = 6$ cm

**Yanıt / Answer B**

**11.** $\overset{\triangle}{ADI} \sim \overset{\triangle}{AIF}$

$k = 1$

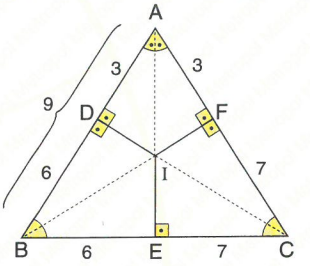
$|AD| = |AF| = 3$ cm

$|BD| = 9 - 3 = 6$ cm

$|BD| = |BE| = 6$ cm

$|EC| = |CF| = 7$ cm

$|BC| = 13$ cm




Çevre / The Perimeter $(\overset{\triangle}{ABC}) = 10 + 9 + 13 = 32$ cm

**Yanıt / Answer D**

**12.** [DI] // [AC]

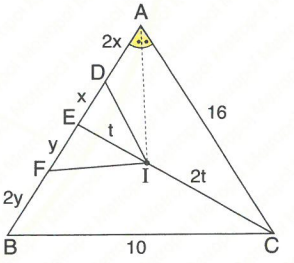
$|DE| = x$

$|DA| = 2x$

[FI] // [BC]

$|EF| = y$,

$|FB| = 2y$




$\frac{|EI|}{|EC|} = \frac{|DI|}{|AC|} \Rightarrow |DI| = \frac{16}{3}$, $|FI| = \frac{10}{3}$

$\frac{16}{10} = \frac{3x}{3y} \Rightarrow \frac{x}{y} = \frac{8}{5}$

[AI] bir açıortaydır.

[AI] is a bisector.

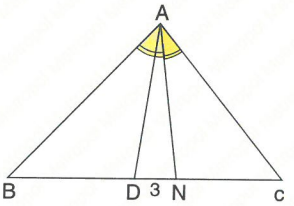
$\frac{|AC|}{|AE|} = \frac{|CI|}{|IE|} \Rightarrow \frac{16}{3x} = \frac{2t}{t} \Rightarrow x = \frac{8}{3} \Rightarrow y = \frac{5}{3}$

Çevre / The Perimeter $(\overset{\triangle}{DIF}) = \frac{16}{3} + \frac{8+5}{3} + \frac{10}{3}$

$= \frac{39}{3} = 13$ cm

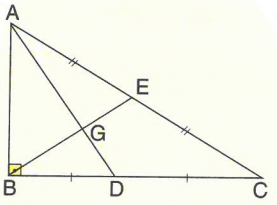
**Yanıt / Answer A**

**1.** IBDI = IDCI,
$m(\widehat{BAN}) = m(\widehat{NAC})$,
IDNI = 3 cm,
2·IABI = 3·IACI
⇒ **IBCI = ? cm**



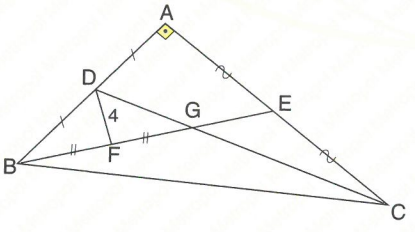

A) 16 B) 18 C) 20 D) 24 E) 30

**2.** IAEI = IECI,
IBDI = IDCI,
IGEI = x + 1 cm,
IBGI = 3x – 1 cm
⇒ **IACI = ? cm**



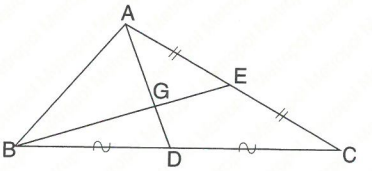

A) 12 B) 18 C) 20 D) 22 E) 24

**3.** [BA] ⊥ [CA],
IBDI = IADI,
IAEI = IECI,
IBFI = IFGI,
IDFI = 4 cm
⇒ **IBCI = ? cm**



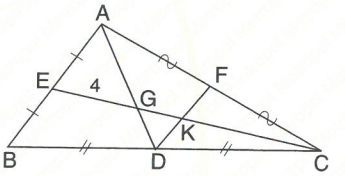

A) 12 B) 16 C) 20 D) 24 E) 32

**4.** IAEI = IECI,
IBDI = IDCI,
IBGI = 2x + 4 cm,
IBEI = 5x cm
⇒ **IBEI = ? cm**



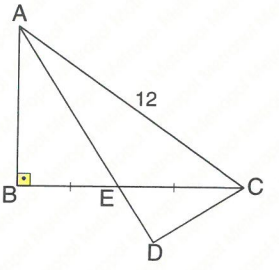

A) 3 B) 6 C) 10 D) 12 E) 15

**5.** IAFI = IFCI,
IBDI = IDCI,
IAEI = IEBI,
IGEI = 4 cm
⇒ **IKCI = ? cm**



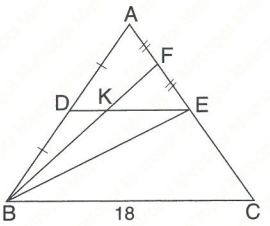

A) 2 B) 3 C) 4 D) 6 E) 8

**6.** $IEDI = \frac{IAEI}{3}$,
IBEI = IECI,
IACI = 12 cm
⇒ **IDCI = ? cm**



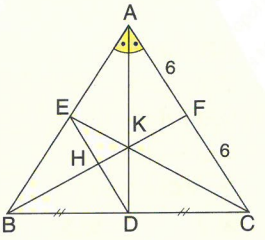

A) 4 B) 6 C) 8 D) 9 E) 10

**7.** IAFI = IFEI,
IAEI = IECI,
IADI = IDBI,
IBCI = 18 cm
⇒ **IKEI = ? cm**



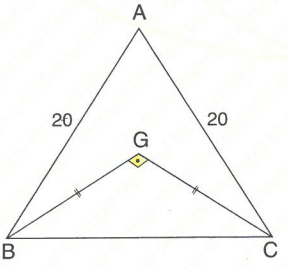

A) 2 B) 3 C) 4 D) 5 E) 6

**8.** $m(\widehat{BAD})=(\widehat{DAC})$,
IBDI = IDCI,
IAFI = IFCI = 6 cm
⇒ **IEDI = ? cm**



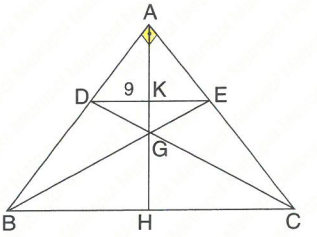

A) 3 B) 6 C) 9 D) 12 E) 15

**9.** G noktası ağırlık merkezidir.
G is center of the gravity.
[BG] ⊥ [GC],
IABI = IACI = 20 cm,
IGBI = IGCI
⇒ **IBCI = ? cm**



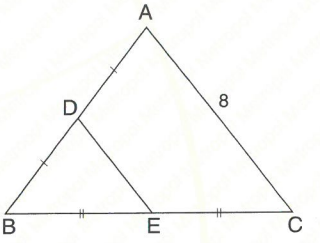

A) 2 B) $2\sqrt{10}$ C) 3 D) 4 E) $4\sqrt{10}$

**10.** G noktası ağırlık merkezidir.
G is center of the gravity.
IDKI = 9 cm,
[BA] ⊥ [CA]
⇒ **IKGI = ? cm**



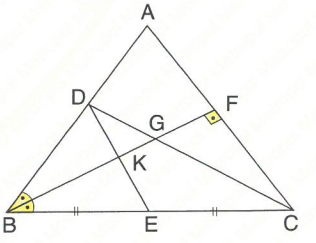

A) 2 B) 3 C) 4 D) 5 E) 6

**11.** IBDI = IDAI,
IBEI = IECI,
IACI = 8 cm
⇒ **IDEI = ? cm**




A) 4 B) 6 C) 7 D) 8 E) 9

**12.** G noktası ağırlık merkezidir.
G is center of the gravity.
[BF] ⊥ [AC],
IBEI = IECI,
IACI = 20 cm,
$m(\widehat{ABF}) = m(\widehat{FBC})$
⇒ **IKEI = ? cm**

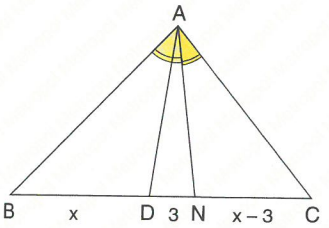



A) 5 B) 6 C) 7 D) 8 E) 9

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | E | D | E | D | A | E | B | E | B | A | A |

**1.**




Açıortay bağıntısından aşağıdaki sonuç yazılır.

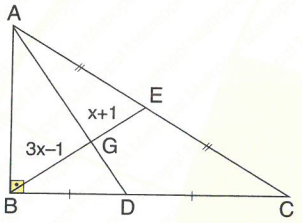
By using the bisector relation, we obtain following result.

$\frac{|AB|}{|AC|} = \frac{|BN|}{|NC|} \Rightarrow \frac{3}{2} = \frac{x+3}{x-2}$

$x = 12 \Rightarrow |BC| = 24$ cm

**Yanıt / Answer D**

**2.**




G noktası şekildeki ABC üçgeninin ağırlık merkezidir.

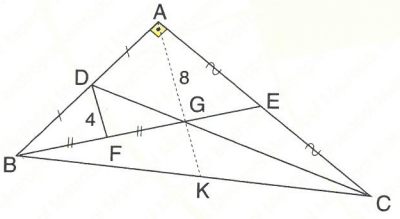
The point G is center of the gravity in the ABC triangle.

$3x - 1 = 2(x + 1) \Rightarrow x = 3$ cm $\Rightarrow |BE| = 12$ cm

$|AE| = |EC| = |BE| \Rightarrow |AC| = 24$ cm

**Yanıt / Answer E**

**3.**




$[DF] // [AG] \Rightarrow B\overset{\triangle}{F}D \sim B\overset{\triangle}{G}A$

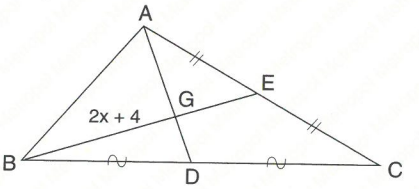
$2 \cdot |DF| = |AG| \Rightarrow |AG| = 2 \cdot 4 = 8$ cm

$\frac{3 \cdot |AG|}{2} = |KA| \Rightarrow |KM| = \frac{3}{2} \cdot 8 = 12$ cm

$|BC| = 2 \cdot |KA| \Rightarrow |BC| = 2 \cdot 12 = 24$ cm

**Yanıt / Answer D**

**4.**

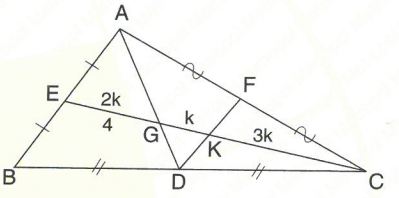



$\frac{|BE|}{|BG|} = \frac{3}{2} \Rightarrow \frac{5x}{2x+4} = \frac{3}{2} \Rightarrow x = 3$ cm

$|BE| = 5x = 5 \cdot 3 = 15$ cm

**Yanıt / Answer E**

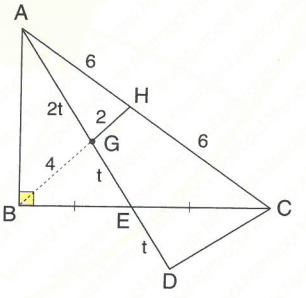
**5.**




$\frac{|GE|}{|CK|} = \frac{2k}{3k} \Rightarrow \frac{4}{|CK|} = \frac{2}{3} \Rightarrow |CK| = 6$ cm

**Yanıt / Answer D**

**6.**




$E\overset{\triangle}{G}B \sim E\overset{\triangle}{D}C$

Benzerlik oranı 1 dir. / The similarity ratio is 1.

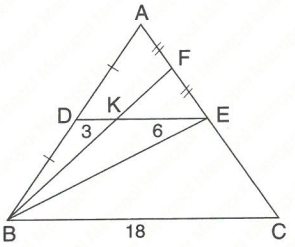
$|BG| = |DC|$

$|BH| = \frac{|AC|}{2} = 6$ cm

$|BG| = 4$ cm, $|DC| = 4$ cm

**Yanıt / Answer A**

**7.**




K noktası şekildeki AEB üçgeninin ağırlık merkezidir.

K is center of the gravity in AEB triangle in the figure.

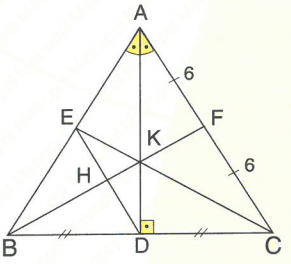
[DE] bir orta tabandır. / [DE] is a middle base.

$|DE| = \frac{|BC|}{2} = \frac{18}{2} = 9\,cm$

$|KE| = \frac{2}{3} \cdot |DE| = \frac{2}{3} \cdot 9 = 6\,cm$

**Yanıt / Answer E**

**8.**

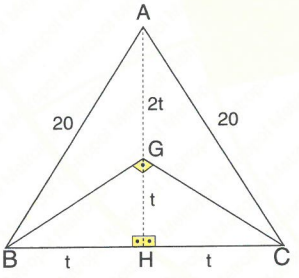



[ED] bir orta tabandır. / [ED] is a middle base.

$|ED| = \frac{|AC|}{2} = 6\,cm$

**Yanıt / Answer B**

**9.**




$|GH| = |BH| = |HC|$ [Muhteşem / The perfect triple]

$20^2 = (3t^2) + t^2$ [Pisagor / Pythagor]

$20^2 = \left(\frac{3\sqrt{2}t}{2}\right)^2 + \left(\frac{\sqrt{2}t}{2}\right)^2$

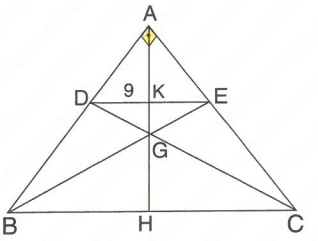
$400 = 10t^2$

$t = 2\sqrt{10}\,cm$

$|BC| = 2 \cdot 2\sqrt{10} = 4\sqrt{10}$

**Yanıt / Answer E**

**10.**




[DE] bir orta tabandır. / [DE] is a middle base.

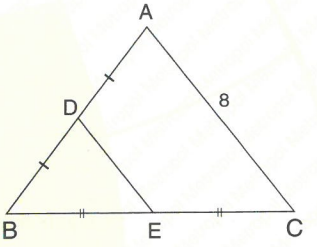
$|DK| = 9\,cm \Rightarrow |BH| = 18\,cm$

$|AH| = |BH| = |HC| = 18\,cm$ [ Muhteşem / The perfect triple ]

$|KG| = \frac{|AH|}{6} = 3\,cm$

**Yanıt / Answer B**

**11.**

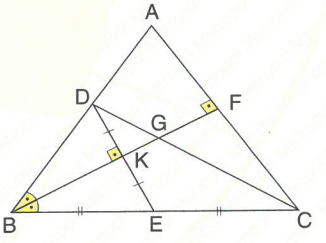



[DE] bir orta tabandır. / [DE] is a middle base.

$|DE| = \frac{|AC|}{2} = 4\,cm$

**Yanıt / Answer A**

**12.**



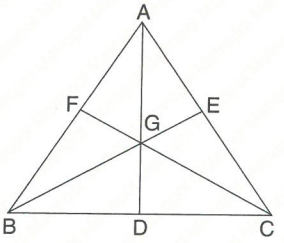

[DE] bir orta tabandır. / [DE] is a middle base.

$|DE| = \frac{|AC|}{2} = 10\,cm$

$|KE| = \frac{|DE|}{2} = 5\,cm$

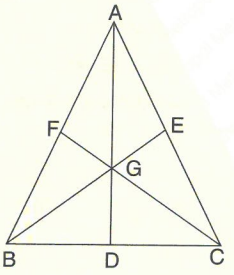
**Yanıt / Answer A**

**1.** G noktası ağırlık merkezidir.
G is center of the gravity.
|AD| = 18 cm,
|BE| = 21 cm,
|CF| = 24 cm
⇒ **|AG| + |BG| + |CG| = ? cm**



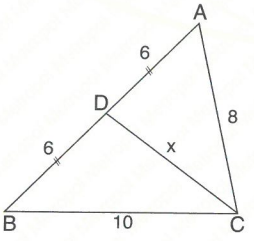

A) 40 B) 42 C) 44 D) 46 E) 48

**2.** G noktası ağırlık merkezidir.
G is center of the gravity.
|AG| = 8 cm,
|BE| = 12 cm,
$|FG| = \frac{5}{2}$ cm
⇒ **|AD| + |BG| + |GC| = ? cm**



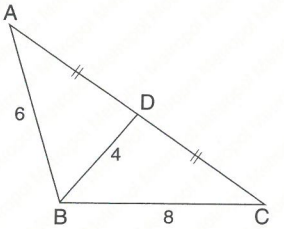

A) 22 B) 23 C) 24 D) 25 E) 26

**3.** |AD| = |DB| = 6 cm
|BC| = 10 cm,
|AC| = 8 cm
⇒ **|DC| = x = ? cm**



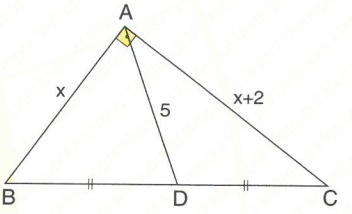

A) 6 B) $2\sqrt{10}$ C) $3\sqrt{5}$ D) $\sqrt{46}$ E) 7

**4.** |AD| = |DC|,
|AB| = 6 cm,
|BD| = 4 cm,
|BC| = 8 cm
⇒ **|AC| = ? cm**



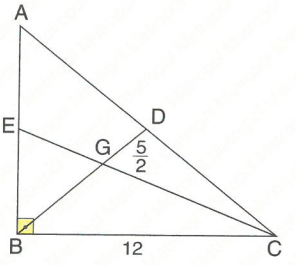

A) $4\sqrt{3}$ B) $2\sqrt{15}$ C) $2\sqrt{34}$ D) $6\sqrt{2}$ E) 9

**5.** [BA] ⊥ [AC],
|BD| = |DC|,
|AB| = x cm,
|AC| = x + 2 cm,
|AD| = 5 cm
⇒ **|AC| = ? cm**



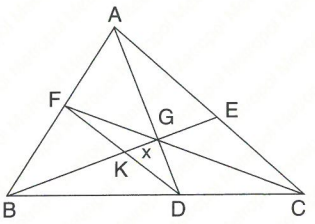

A) 7 B) $\frac{15}{2}$ C) 8 D) $\frac{17}{2}$ E) 9

**6.** G noktası ağırlık merkezidir.
The point G is center of the gravity.
[AB] ⊥ [BC],
$|GD| = \frac{5}{2}$ cm,
|BC| = 12 cm
⇒ **|EB| = ? cm**



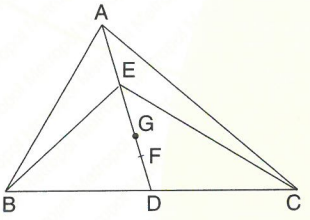

A) 3 B) $\frac{7}{2}$ C) 4 D) $\frac{9}{2}$ E) 5

**7.** G noktası ağırlık merkezidir.
The point G is center of the gravity.
|BE| = 12 cm
⇒ **|KG| = x = ? cm**




A) 1 B) $\frac{3}{2}$ C) 2 D) $\frac{5}{2}$ E) 3

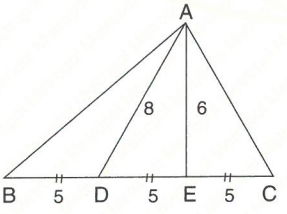
**8.**




G, $\widehat{ABC}$ nin; F, $\widehat{FBC}$ nin ağırlık merkezidir.
G is center of the gravity in the $\widehat{ABC}$; F is center of the gravity in the $\widehat{ABC}$.
|GF| = 2 cm, |ED| = 4·|AE| ⇒ **|AD| = ? cm**

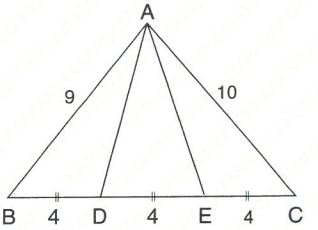
A) 18 B) 21 C) 24 D) 27 E) 30

**9.** |BD| = |DE| = |EC| = 5 cm,
|AD| = 8 cm,
|AE| = 6 cm
⇒ **$|AB|^2 + |AC|^2$ = ? cm**



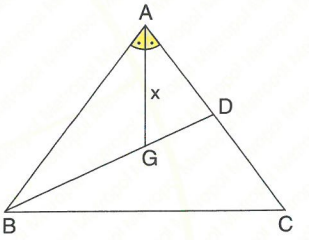

A) 160 B) 170 C) 180 D) 190 E) 200

**10.** |BD| = |DE| = |EC| = 4 cm,
|AB| = 9 cm,
|AC| = 10 cm
⇒ **$|AD|^2 + |AE|^2$ = ? $cm^2$**



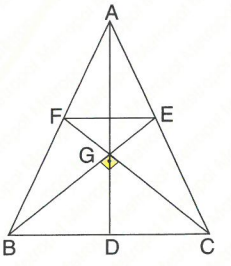

A) 90 B) 96 C) 117 D) 156 E) 181

**11.** G noktası ağırlık merkezidir.
G is center of the gravity.
m($\widehat{BAG}$) = m($\widehat{GAC}$),
|AB| = 15 cm,
|BC| = 18 cm
⇒ **|AG| = x = ? cm**




A) $\frac{13}{2}$ B) 7 C) $\frac{15}{2}$ D) 8 E) $\frac{17}{2}$

**12.** G noktası ağırlık merkezidir.
G is center of the gravity.
[BE] ⊥ [FC],
|FE| = 6 cm
⇒ **|AD| = ? cm**

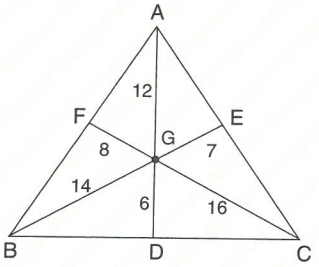



A) 12 B) 15 C) 16 D) 18 E) 20

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | D | D | C | C | D | C | E | E | C | D | D |

**1.**



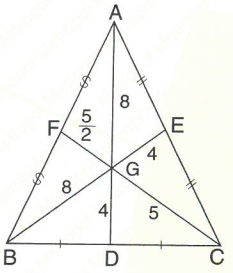

G noktası şekildeki ABC üçgeninin ağırlık merkezidir.

The point G is center of the gravity in the ABC triangle.

$|AG| + |BG| + |CG| = 12 + 14 + 16 = 42$ cm

**Yanıt / Answer B**

**2.**




G noktası şekildeki ABC üçgeninin ağırlık merkezidir.

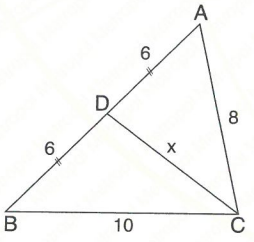
The point G is center of the gravity in the ABC triangle.

$|AD| = 12$ cm, $|BG| = 8$ cm, $|GC| = 5$ cm

$|AD| + |BG| + |GC| = 12 + 8 + 5 = 25$ cm

**Yanıt / Answer D**

**3.**

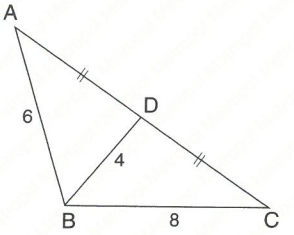



[CD] bir kenarortaydır. / [CD] is a median.

$2x^2 = 10^2 + 8^2 - \frac{12^2}{2} \Rightarrow x^2 = 46 \Rightarrow \sqrt{46}$ cm

**Yanıt / Answer D**

**4.**

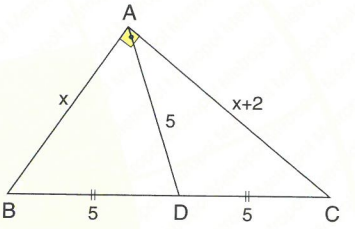



[BD] bir kenarortaydır. / [BD] is a median.

$2 \cdot 4^2 = 6^2 + 8^2 - \frac{a^2}{2} \Rightarrow a = 2\sqrt{34}$ cm

**Yanıt / Answer C**

**5.**



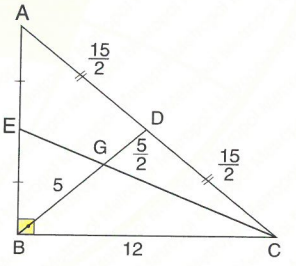

$\left.\begin{array}{l} m(\widehat{BAC}) = 90° \\ |BD| = |DC| \end{array}\right\} \Rightarrow |BD| = |DC| = |AD| = 5$ cm

$x^2 + (x+2)^2 = 10^2$ [ Pythagor ]

$x = 6$ cm $\Rightarrow |AC| = x + 2 = 6 + 2 = 8$ cm

**Yanıt / Answer C**

**6.**




G noktası şekildeki ABC üçgeninin ağırlık merkezidir.

The point G is center of the gravity in the ABC triangle.

$|GD| = \frac{5}{2}$ cm $\Rightarrow |GB| = 5$ cm

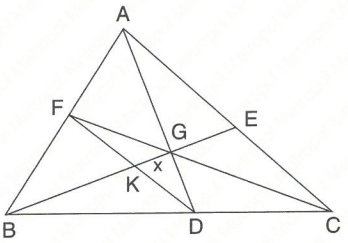
$m(B) = 90° \Rightarrow |BD| = |AD| = |DC| = \frac{15}{2}$ cm

$|AB|^2 + 12^2 = 15^2$ [ Pythagor ]

$|AB| = 9$ cm $\Rightarrow |EB| = \frac{9}{2}$ cm

**Yanıt / Answer D**

**7.**




G noktası şekildeki ABC üçgeninin ağırlık merkezidir.

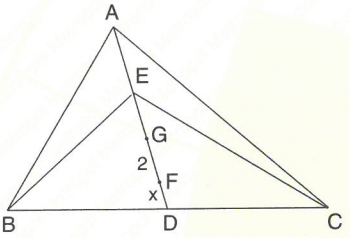
The point G is center of the gravity in the ABC triangle.

[FD] orta tabandır. / [FD] is a middle base.

$|GK| = \frac{|BE|}{6} \Rightarrow |GK| = \frac{12}{6} = 2$ cm

**Yanıt / Answer C**

**8.**




$|FD| = x$ cm $\Rightarrow |EF| = 2x$ cm

$|GE| = 2x-2$ cm ve/and) $|GD| = x+2$ cm

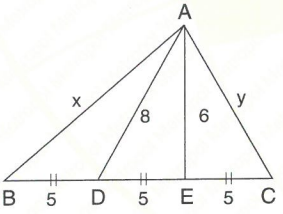
$|AE| = \frac{|ED|}{4} = \frac{3x}{4} \Rightarrow |AE| + |GE| = 2 \cdot |GD|$

$\frac{3x}{4} + (2x-2) = 2 \cdot (2x+2)$

$\frac{3x}{4} = 6 \Rightarrow x = 8$ cm $\Rightarrow |AD| = 30$ cm

**Yanıt / Answer E**

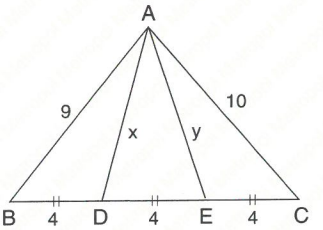
**9.**




$$\left.\begin{array}{l} 2 \cdot 8 = x^2 + 6^2 - \frac{10^2}{2} \\ 2 \cdot 6^2 = y^2 + 8^2 - \frac{10^2}{2} \end{array}\right\} \Rightarrow x^2 + y^2 = 200 \text{ cm}$$

**Yanıt / Answer E**

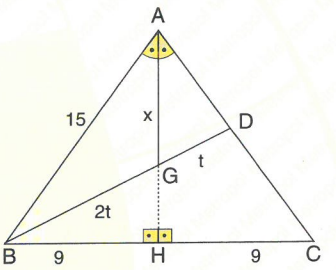
**10.**




$$\left.\begin{array}{l} 2 \cdot x^2 = 9^2 + y^2 - \frac{8^2}{2} \\ 2 \cdot y^2 = 10^2 + x^2 - \frac{8^2}{2} \end{array}\right\} \Rightarrow x^2 + y^2 = 117 \text{ cm}$$

**Yanıt / Answer C**

**11.**




[AH], hem açıortay hem de kenarortaydır.

[AH] is a bisector and is a median.

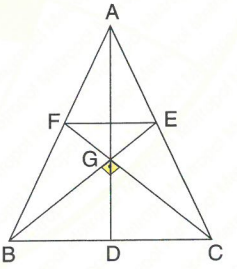
$\frac{|AD|}{15} = \frac{t}{2t} \Rightarrow |AD| = \frac{15}{2} \Rightarrow |AC| = 15$

$|AH|^2 + 9^2 = 15^2$

$|AH| = 12$ cm $\Rightarrow x = 8$ cm

**Yanıt / Answer D**

**12.**




[FE] bir orta tabandır. / [FE] is a middle base.

$|BC| = 2 \cdot |FE| = 2 \cdot 6 = 12$ cm

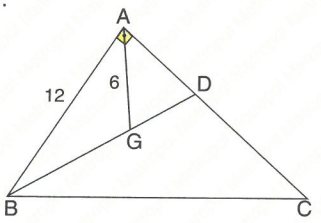
$$\left.\begin{array}{l} [BG] \perp [CG] \\ |BD| = |DC| \end{array}\right\} \Rightarrow |GD| = |BD| = |DC|$$

$|GD| = \frac{|BC|}{2} = 6$ cm $\Rightarrow |AD| = 3 \cdot |GD|$

$\Rightarrow |AD| = 18$ cm

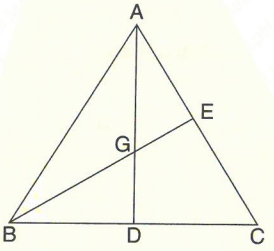
**Yanıt / Answer D**

**1.** G noktası ağırlık merkezidir.
G is center of the gravity.
[BA] ⊥ [AC],
|AG| = 6 cm,
|AB| = 12 cm
⇒ **|AC| = ? cm**



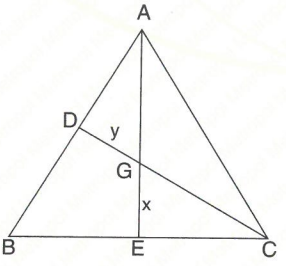

A) 9 B) $6\sqrt{5}$ C) $6\sqrt{3}$ D) $6\sqrt{2}$ E) 6

**2.** G noktası ağırlık merkezidir.
G is center of the gravity.
|AG| = (2y – 4) cm,
|GD| = (2x) cm,
|BG|= (2x – 6) cm,
|GE| = 4 cm
⇒ **y = ? cm**



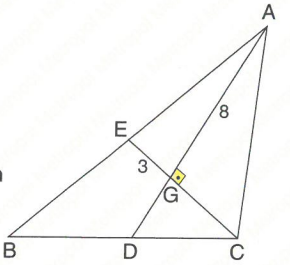

A) 13 B) 16 C) 17 D) 19 E) 21

**3.** G noktası ağırlık merkezidir.
G is center of the gravity.
|AE| + |CD| = 36 cm,
|DG| = y cm,
|GE| = x cm
⇒ **x + y = ? cm**



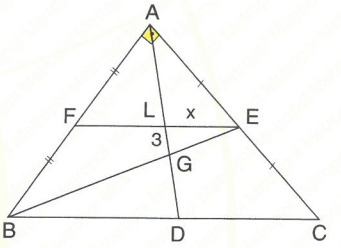

A) 8 B) 10 C) 12 D) 18 E) 20

**4.** G noktası ağırlık merkezidir.
G is center of the gravity.
[AD] ⊥ [CE],
|AG| = 8 cm,
|GE| = 3 cm
⇒ **$|AC|^2 + |BC|^2 + |AB|^2$ = ? cm**



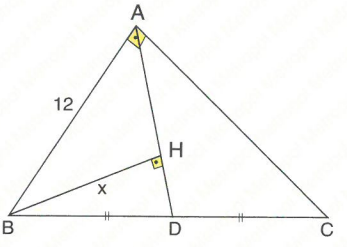

A) 450 B) 600 C) 625 D) 720 E) 900

**5.** G noktası ağırlık merkezidir.
G is center of the gravity.
[EF] ∩ [AD] = {L},
[BA] ⊥ [CA]
|AF| = |FB|,
|LG| = 3 cm
⇒ **|LE| = x = ? cm**



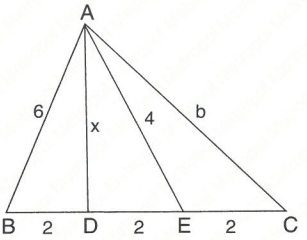

A) 4,5 B) 6 C) 9 D) 9,5 E) 12

**6.** $A(\overset{\triangle}{ABC}) = 96\,cm^2$,
[BA] ⊥ [AC],
[BH] ⊥ [AD],
|BD| = |DC|,
|AB| = 12 cm
⇒ **|BH| = x = ? cm**



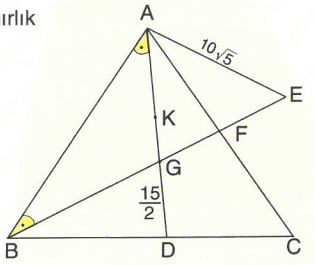

A) 6 B) 8 C) 8,4 D) 9,6 E) 12

**7.** |BD| = |DE| = |EC| = 2 cm,
|AE| = 4 cm,
|AB| = 6 cm
|AD| = x cm
⇒ **|AC| = b = ? cm**




A) $2\sqrt{3}$ B) $3\sqrt{2}$ C) $3\sqrt{3}$ D) $4\sqrt{2}$ E) $4\sqrt{3}$

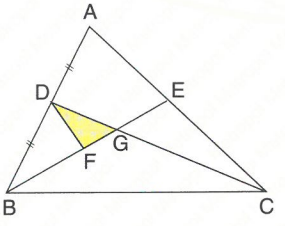
**8.** G, $\overset{\triangle}{ABC}$ nin; K, $\overset{\triangle}{ABE}$ nin ağırlık merkezidir.
G is center of the gravity in the $\overset{\triangle}{ABC}$; K is center of the gravity in the $\overset{\triangle}{ABE}$.
$|GD| = \frac{15}{2}$ cm,
$|AE| = 10\sqrt{5}$ cm,
$m(\widehat{ABE}) = m(\widehat{BAD})$
⇒ **|AB| = ? cm**




A) 16 B) $12\sqrt{5}$ C) 15 D) 18 E) 20

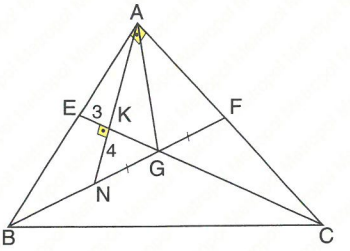
**9.** G noktası ağırlık merkezidir.
G is center of the gravity.
[DF] // [AC]

$$\Rightarrow \frac{A(\overset{\triangle}{DFG})}{A(\overset{\triangle}{ABC})} = ?$$



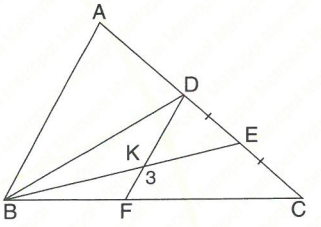

A) $\frac{1}{8}$ B) $\frac{1}{12}$ C) $\frac{5}{36}$ D) $\frac{1}{18}$ E) $\frac{1}{24}$

**10.** G noktası ağırlık merkezidir.
G is center of the gravity.
[BA] ⊥ [AC],
[AN] ⊥ [CE],
|NG| = |GF|,
|EK| = 3 cm,
|KN| = 4 cm
⇒ **|BC| = ? cm**



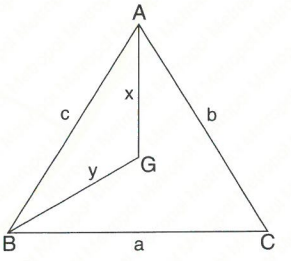

A) 15 B) 18 C) 24 D) 30 E) 36

**11.** [DF] // [AB],
[DF] ∩ [BE] = {K},
|AD| = |DC|,
|DE| = |EC|,
|KF| = 3 cm
⇒ **|AB| = ? cm**




A) 24 B) 18 C) 15 D) 12 E) 9

**12.** G noktası ağırlık merkezidir.
G is center of the gravity.
|AG| = x cm,
|BG| = y cm,
x + y =12 cm
⇒ **$V_b + V_a$ = ? cm**

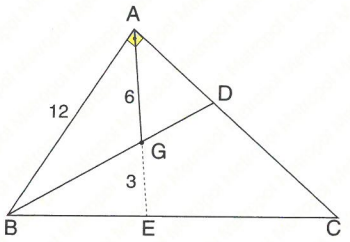



A) 14 B) 16 C) 18 D) 22 E) 24

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | B | C | B | C | D | B | E | E | D | B | C |

1.




$|BC| = 2\cdot|AE| = 18$ cm

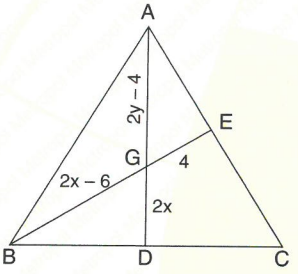
$|AB|^2 + |AC|^2 = |BC|^2$

$|AC|^2 = 18^2 - 12^2$

$|AC| = 6\sqrt{5}$ cm

**Yanıt / Answer B**

2.




G noktası şekildeki ABC üçgeninin ağırlık merkezidir.

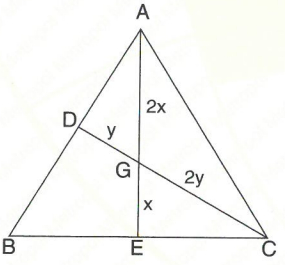
The point G is center of the gravity in the ABC triangle.

$2x - 6 = 2\cdot 4 \Rightarrow 2x = 14 \Rightarrow x = 7$ cm

$2y - 4 = 2\cdot 14 \Rightarrow 2y = 32 \Rightarrow y = 16$ cm

**Yanıt / Answer B**

3.




G noktası şekildeki ABC üçgeninin ağırlık merkezidir.

The point G is center of the gravity in the ABC triangle.

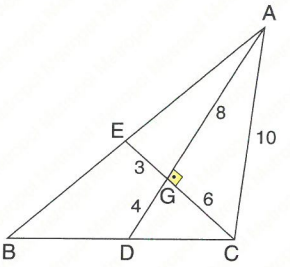
$|AE| = 3\cdot|GE| \Rightarrow |AE| = 3x$ cm

$|CD| = 3\cdot|GD| \Rightarrow |CD| = 3y$ cm

$3x + 3y = 36 \Rightarrow x + y = 12$ cm

**Yanıt / Answer C**

4.




$|GC| = 2\cdot|GE| \Rightarrow |GC| = 3\cdot 2 = 6$ cm

$|AC|^2 = 8^2 + 6^2$ [ Pythagor ]

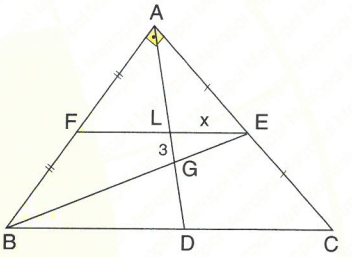
$|AC| = 10$ cm

$|AG| \perp |GC| \Rightarrow 5\cdot|AC|^2 = |AB|^2 + |BC|^2$

$|AC|^2 + |AB|^2 + |BC|^2 = 6\cdot|AC|^2 = 6\cdot 10^2 = 600$ cm$^2$

**Yanıt / Answer B**

5.




$|AD| = 6\cdot|LG| = 18$ cm $\Rightarrow |BC| = 18\cdot 2 = 36$ cm

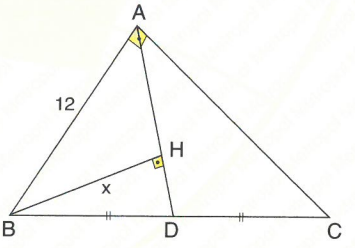
[LE], ADC üçgeninin orta tabanıdır.

[LE] is middle base in the ADC triangle.

$x = \frac{|DC|}{2} = \frac{18}{2} = 9$ cm

**Yanıt / Answer C**

6.




$A(\overset{\triangle}{ABC}) = 96$ cm$^2 \Rightarrow \frac{12\cdot|AC|}{2} = 96$

$|AC| = 16$ cm $\Rightarrow |BC| = 20$ cm

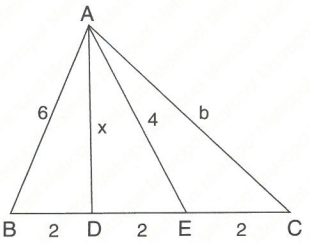
$|AD| = \frac{|BC|}{2} = 10$ cm $\Rightarrow A(\overset{\triangle}{ABD}) = \frac{x\cdot|AD|}{2}$

$|BD| = |DC| \Rightarrow A(\overset{\triangle}{ABD}) = A(\overset{\triangle}{ADC}) = \frac{96}{2} = \frac{10\cdot x}{2}$

$\Rightarrow x = 9{,}6$ cm

**Yanıt / Answer D**

**7.**

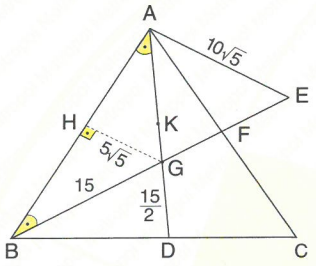



$2 \cdot x^2 = 6^2 + 4^2 - \frac{4^2}{2} \Rightarrow x^2 = 22\,\text{cm}$

$2 \cdot 4^2 = x^2 + b^2 - \frac{4^2}{2} \Rightarrow b^2 \Rightarrow b = 3\sqrt{2}\ \text{cm}$

**Yanıt / Answer B**

**8.**




G noktası şekildeki ABC üçgeninin ağırlık merkezidir.

The point G is center of the gravity in the ABC triangle.

$|AG| = 2 \cdot |GD| = 2 \cdot \frac{15}{2} = 15$ cm

$|AG| = |GB| = 15$cm

[HG], BAE üçgeninin orta tabanıdır.

[HG] is a middle base in the BAE triangle.

$|HG| = \frac{|AE|}{2} = \frac{10\sqrt{5}}{2} = 5\sqrt{5}$ cm

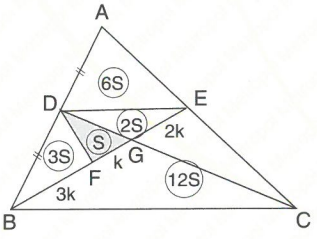
$[HG] \perp [AB]$

$15^2 = |HB|^2 + (5\sqrt{5})^2$ [Pythagor]

$|HB| = 10$ cm $\Rightarrow |AB| = 2 \cdot 10 = 20$ cm

**Yanıt / Answer E**

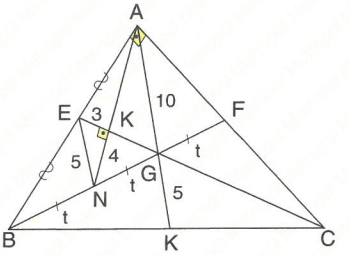
**9.**




$[DF] \parallel [AC] \Rightarrow \frac{A(\overset{\triangle}{DFG})}{A(\overset{\triangle}{ABC})} = \frac{S}{24S} = \frac{1}{24}$

**Yanıt / Answer E**

**10.**




$[EN] = \sqrt{3^2 + 4^2} = 5$ cm [Pythagor]

[EN], ABG üçgeninin orta tabanıdır.

[EN] is a middle base in the ABG triangle.

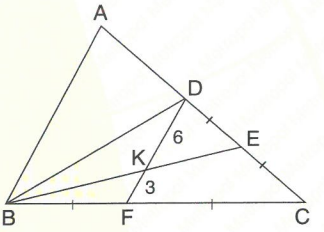
$|AG| = 2 \cdot |EN| = 2 \cdot 5 = 10$ cm

$|AG| = 10$ cm $\Rightarrow |KA| = 15$ cm

$|BC| = 2 \cdot |KA| = 2 \cdot 15 = 30$ cm

**Yanıt / Answer D**

**11.**




K noktası ağırlık merkezidir. / K is center of the gravity.

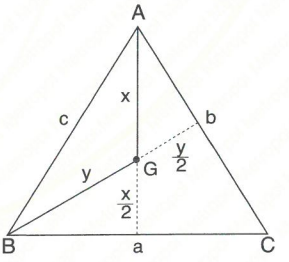
$|DK| = 2 \cdot |KF| = 2 \cdot 3 = 6$ cm

[DF] bir orta tabandır. / [DF] is a middle base.

$|AB| = 2 \cdot |DF| = 2 \cdot 9 = 18$ cm

**Yanıt / Answer B**

**12.**




$V_a = x + \frac{x}{2} = \frac{3x}{2}$ cm

$V_a = y + \frac{y}{2} = \frac{3y}{2}$ cm

$V_a = V_b = \frac{3}{2} \cdot (x + y) = \frac{3}{2} \cdot 12 = 18$ cm

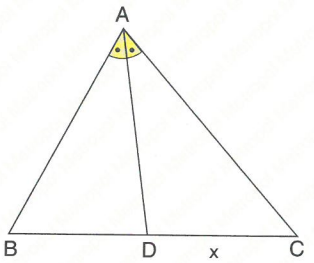
**Yanıt / Answer C**

**1.** $m(\widehat{BAD}) = m(\widehat{DAC})$,

$\frac{|BA|}{|AC|} = \frac{3}{4}$,

$|BC| = 14$ cm

$\Rightarrow$ **$|DC| = x = ?$ cm**




A) 4 B) 5 C) 6 D) 7 E) 8

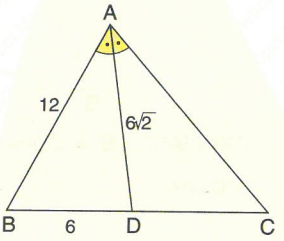
**2.** $m(\widehat{BAD}) = m(\widehat{DAC})$,

$|AD| = 6\sqrt{2}$ cm,

$|AB| = 12$ cm,

$|BD| = 6$ cm

$\Rightarrow$ **$|DC| = ?$ cm**




A) 4 B) 5 C) 6 D) 7 E) 8

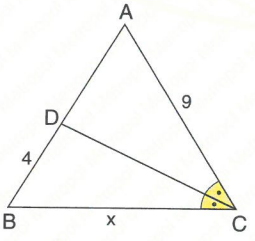
**3.** $|AB| + |BC| + |CA| = 28$ cm,

$m(\widehat{ACD}) = m(\widehat{DCB})$,

$|BD| = 4$ cm

$|AC| = 9$ cm

$\Rightarrow$ **$|BC| = x = ?$ cm**




A) 9 B) 10 C) 11 D) 12 E) 13

**4.** $m(\widehat{ABD}) = m(\widehat{DBC})$,

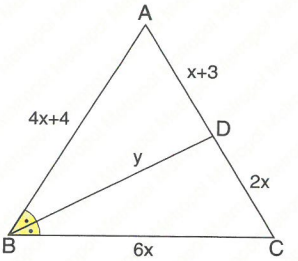
$|BA| = 4x + 4$ cm,

$|AD| = x + 3$ cm,

$|DC| = 2x$ cm,

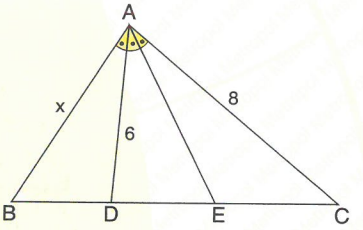
$|BC| = 6x$ cm

$\Rightarrow$ **$|BD| = y = ?$ cm**




A) 5 B) 6 C) 7 D) $8\sqrt{10}$ E) $8\sqrt{12}$

**5.**




$m(\widehat{BAD}) = m(\widehat{DAE}) = m(\widehat{EAC})$, $|AC| = 8$ cm,

$|AD| = 6$ cm, $|DC| = 7$ cm $\Rightarrow$ **$|AB| = x = ?$ cm**

A) 6 B) 7 C) 8 D) 9 E) 12

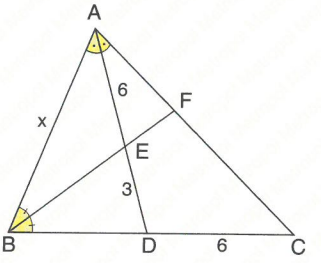
**6.** $m(\widehat{BAD}) = m(\widehat{DAC})$,

$m(\widehat{ABF}) = m(\widehat{FBC})$,

$|AE| = |DC| = 6$ cm,

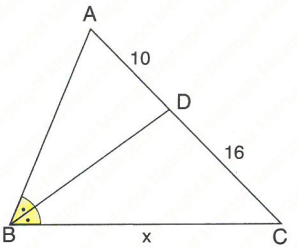
$|ED| = 3$ cm

$\Rightarrow$ **$|AB| = x = ?$ cm**



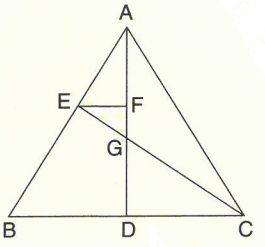

A) 9 B) 10 C) 12 D) 16 E) 18

**7.** $m(\widehat{ABD}) = m(\widehat{DBC})$,
$|AD| = 10$ cm,
$|DC| = 16$ cm,
$|BC| - |AB| = 18$ cm
$\Rightarrow$ **$|BC| = x = ?$ cm**



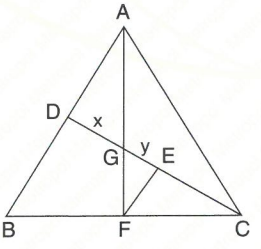

A) 28 B) 36 C) 42 D) 48 E) 54

**8.** G noktası ağırlık merkezidir.
The point G is center of the gravity.
$[EF] \parallel [BC]$,
$|FG| = 2$ cm
$\Rightarrow$ **$|AF| = ?$ cm**



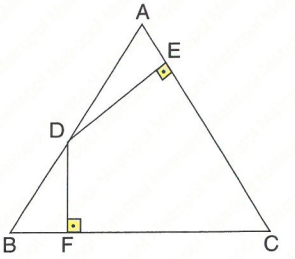

A) 4 B) 6 C) 7 D) 8 E) 9

**9.** G noktası ağırlık merkezidir.
The point G is center of the gravity.
$[FE] \parallel [AB]$,
$|DG| = x$ cm,
$|GE| = y$ cm,
$x - y = 3$ cm
$\Rightarrow$ **$|EC| = ?$ cm**



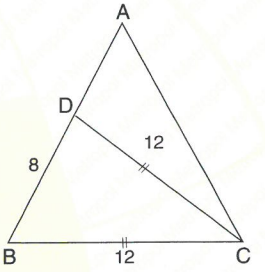

A) 6 B) 7 C) 8 D) 9 E) 10

**10.** $|AD| = |DB|$,
$[DE] \perp [AC]$,
$[DF] \perp [BC]$,
$|DE| = 4 \cdot |DF|$,
$|BC| = 12$ cm
$\Rightarrow$ **$|AC| = ?$ cm**




A) 3 B) 4 C) 6 D) 8 E) 9

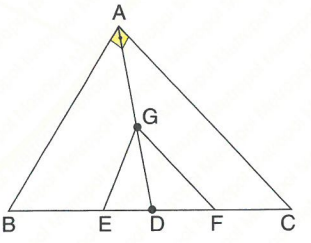
**11.**




$|AB| = |AC|$, $|CB| = |CD| = 12$ cm, $|BD| = 8$ cm
$\Rightarrow$ **Çevre / The perimeter $(\overset{\triangle}{ADC}) = ?$ cm**

A) 32 B) 36 C) 48 D) $30 + 4\sqrt{3}$ E) $32 + 2\sqrt{2}$

**12.** G noktası ağırlık merkezidir.
The point G is center of the gravity.
$[GE] \parallel [AB]$,
$[GF] \parallel [AC]$,
$|GE| = 3$ cm,
$|GF| = 4$ cm
$\Rightarrow$ **$|GD| = ?$ cm**

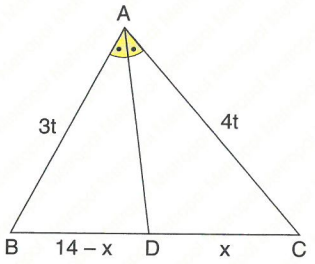



A) 5 B) $\frac{5}{2}$ C) $\frac{5}{3}$ D) $\frac{5}{4}$ E) 1

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | A | D | D | C | A | D | B | D | A | C | B |

1.



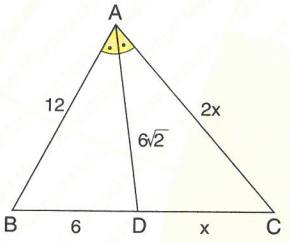

Açıortay teoreminden aşağıdakiler yazılabilir.

By using the median theorem, we can write followings.

$\frac{x}{14-x} = \frac{4t}{3t} \Rightarrow 3x = 56 - 4x \Rightarrow x = 8\,cm$

**Yanıt / Answer E**

2.



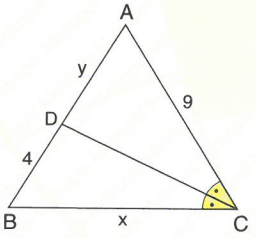

Açıortay teoreminden aşağıdakiler yazılabilir.

By using the median theorem, we can write followings.

$(6\sqrt{2})^2 = 12 \cdot 2x - 6 \cdot x \Rightarrow x = 4\,cm$

**Yanıt / Answer A**

3.




$\left.\begin{array}{l} x + y + 4 + 9 = 28 \Rightarrow x + y = 15\,cm \\ \frac{x}{9} = \frac{4}{y} \Rightarrow xy = 36 \end{array}\right\} \Rightarrow x = 12\,cm$

**Yanıt / Answer D**

4. Açıortay teoremi

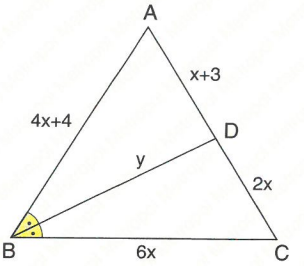
The angle bisector theorem is

$\frac{4x+4}{6x} = \frac{x+3}{2x}$

$x = 5\,cm$

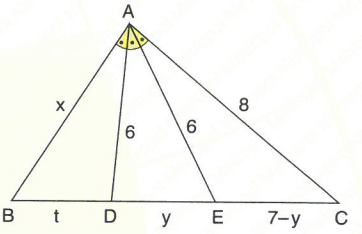
$y = \sqrt{24 \cdot 30 - 8 \cdot 10}$

$= \sqrt{640} = 8\sqrt{10}\,cm$




**Yanıt / Answer D**

5.




$|DC| = 7\,cm$,

$\frac{8}{6} = \frac{7-y}{y} \Rightarrow y = 3\,cm$

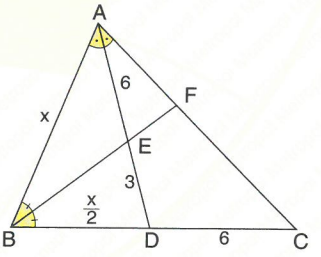
$|AE| = \sqrt{6 \cdot 8 - 3 \cdot 4} = 6\,cm$

$\frac{6}{x} = \frac{3}{t} \Rightarrow x = 2t$

$6^2 = 6x - 3t \Rightarrow 36 = 9t \Rightarrow t = 4 \Rightarrow x = 8\,cm$

**Yanıt / Answer C**

6.




[BF] bir açıortaydır. / [BF] is a bisector.

$\frac{|AB|}{|BD|} = \frac{6}{3} \Rightarrow |BD| = \frac{x}{2}$

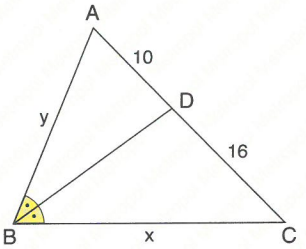
[AD] bir açıortaydır. / [AD] is a bisector.

$\frac{|AC|}{|AB|} = \frac{6}{\frac{x}{2}} \Rightarrow \frac{|AC|}{x} = \frac{6}{\frac{x}{2}} \Rightarrow |AC| = 12\,cm$

$|AD|^2 = 12 \cdot x - 6 \cdot \frac{x}{2} \Rightarrow 9^2 = 9x \Rightarrow x = 9\,cm$

**Yanıt / Answer A**

**7.**




[BD] bir açıortaydır. / [BD] is a bisector.

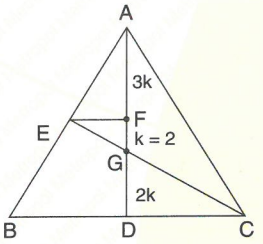
$\frac{|BC|}{|AB|} = \frac{16}{10} \Rightarrow \frac{x}{y} = \frac{8}{5} \Rightarrow y = \frac{5x}{8}$

$x - y = 18\,cm \Rightarrow x - \frac{5x}{8} = 18$

$\Rightarrow \frac{3x}{8} = 18 \Rightarrow x = 48\,cm$

**Yanıt / Answer D**

**8.**




G noktası şekildeki ABC üçgeninin ağırlık merkezidir.

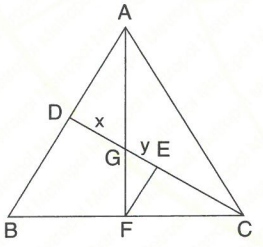
The point G is center of the gravity in the ABC triangle.

[EF] bir orta tabandır. / [EF] is a middle base.

$|AF| = 3 \cdot |FG| = 3 \cdot 2 = 6$ cm

**Yanıt / Answer B**

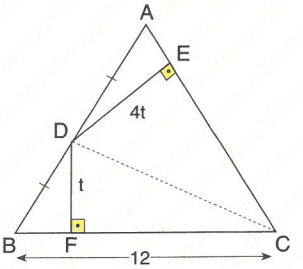
**9.**




$\left.\begin{array}{l} x - y = 3 \\ x = 2y \end{array}\right\} \Rightarrow \begin{array}{l} y = 3\,cm \\ x = 6\,cm \end{array} \Rightarrow |EG| = x + y = 9\,cm$

**Yanıt / Answer D**

**10.**



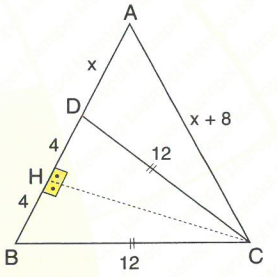

$|AD| = |DB|$

$\Rightarrow A(\overset{\triangle}{ADC}) = A(\overset{\triangle}{DBC}) \Rightarrow \frac{12 \cdot t}{2} = \frac{|AC| \cdot 4t}{2}$

$|AC| = 3\,cm$

**Yanıt / Answer A**

**11.**




$|CD| = |BC| \Rightarrow [CH] \perp [DB] \Rightarrow |DH| = |HB| = 4$ cm

$|CH| = \sqrt{12^2 - 4^2} = 8\sqrt{2}$ [ *Pythagor* ]

$|AD| = x$ cm $\Rightarrow |AB| = |AC| = x + 8$ cm

$(x + 8)^2 = (x + 4)^2 + (8\sqrt{2})^2$ [ *Pythagor* ]

$x^2 + 16x + 64 = x^2 + 8x + 16 + 128$

$8x = 80 \Rightarrow x = 10$ cm

Çevre / *The perimeter* $(\overset{\triangle}{ABC}) = 48$ cm

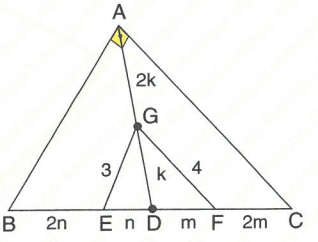
**Yanıt / Answer C**

**12.** $\frac{|GE|}{|AB|} = \frac{1}{3}$

$|AB| = 9\,cm$

$\frac{|GF|}{|AC|} = \frac{1}{3}$

$|AC| = 12\,cm$




$|BC|^2 = |AB|^2 + |AC|^2$ [ *Pisagor* / Pythagor ]

$|BC|^2 = 9^2 + 12^2 \Rightarrow |BC| = 15$ cm,

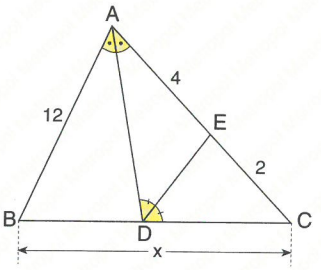
$|BD| = |DC| = |AD| = \frac{15}{2}$

$|AD| = 15$ cm $\Rightarrow |GD| = 5$ cm

$|GD| = \frac{|AD|}{3} \Rightarrow |GD| = \frac{\frac{15}{2}}{3} = \frac{5}{2}$

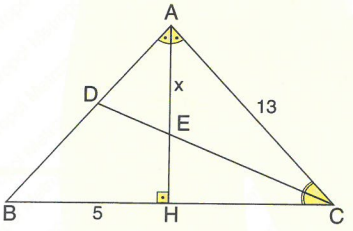
**Yanıt / Answer B**

**1.** $m(\widehat{BAD})=m(\widehat{DAC})$,
$m(\widehat{ADE})=m(\widehat{EDC})$
$|AE| = 4$ cm
$|EC| = 2$ cm,
$|AB| = 12$ cm
$\Rightarrow$ **$|BC| = x = ?$ cm**



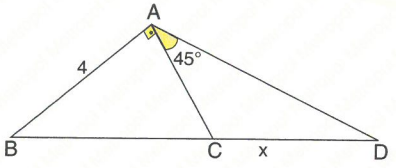

A) $2\sqrt{3}$ B) $4\sqrt{3}$ C) $6\sqrt{3}$ D) $8\sqrt{3}$ E) $10\sqrt{3}$

**2.** $m(\widehat{BAH}) = m(\widehat{HAC})$,
$m(\widehat{ACD}) = m(\widehat{DCB})$,
$[AH] \perp [BC]$,
$|AC| = 13$ cm,
$|BH| = 5$ cm
$\Rightarrow$ **$|AE| = x = ?$ cm**




A) $\frac{48}{5}$ B) $\frac{26}{3}$ C) $\frac{13}{3}$ D) $\frac{13}{2}$ E) 4

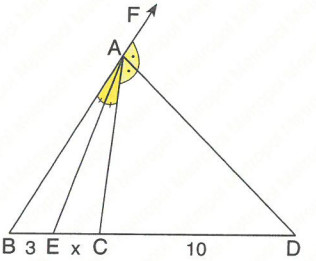
**3.**




$[BA] \perp [AC]$, $m(\widehat{CAD}) = 45°$, $|AC| = 3$ cm, $|AB| = 4$ cm
$\Rightarrow$ **$|CD| = x = ?$ cm**

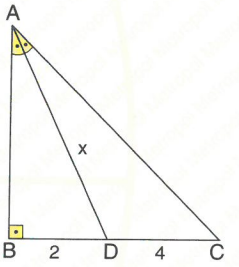
A) 12 B) 15 C) 16 C) 18 E) 21

**4.** $m(\widehat{BAE}) = m(\widehat{EAC})$,
$m(\widehat{CAD}) = m(\widehat{DAF})$,
$|BE| = 3$ cm,
$|CD|=10$ cm
$\Rightarrow$ **$|EC| = x = ?$ cm**



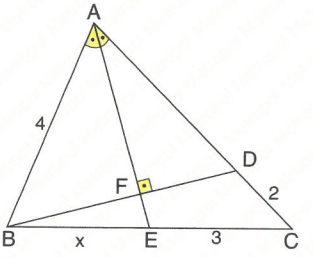

A) $\frac{7}{2}$ B) $\frac{5}{2}$ C) 2 D) $\frac{3}{2}$ E) 1

**5.** $m(\widehat{BAD}) = m(\widehat{DAC})$,
$[AB] \perp [BC]$,
$|BD| = 2$ cm,
$|DC| = 4$ cm
$\Rightarrow$ **$|AD| = x = ?$ cm**




A) 4 B) 5 C) 6 D) $2\sqrt{6}$ E) $3\sqrt{5}$

**6.** $m(\widehat{BAE}) = m(\widehat{EAC})$,
$[AF] \perp [BD]$,
$|DC| = 2$ cm,
$|EC| = 3$ cm,
$|AB| = 4$ cm
$\Rightarrow$ **$|BE| = x = ?$ cm**




A) 5 B) 4 C) 3 D) 2 E) 1

**7.** G noktası ağırlık merkezidir.

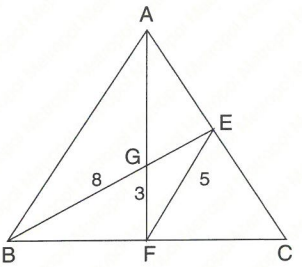
G is center of the gravity

IBGI = 8 cm,

IGFI = 3 cm,

IEFI = 5 cm

⇒ **IECI = ? cm**




A) $2\sqrt{13}$ B) $2\sqrt{14}$ C) $2\sqrt{15}$ D) 8 E) $2\sqrt{17}$

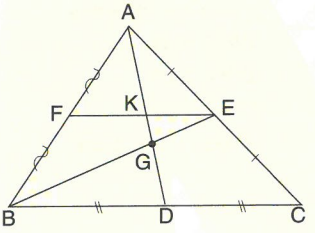
**8.** IAFI = IFBI,

IAEI = IECI

IBDI = IDCI

IKGI = 3 cm

⇒ **IADI = ? cm**



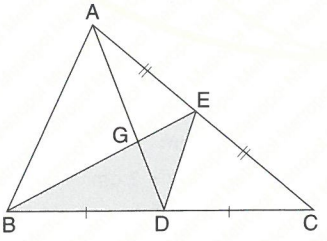

A) 12 B) 16 C) 18 D) 20 E) 22

**9.** G ağırlık merkezidir.

G is center of the gravity.

$A(\overset{\triangle}{ABC}) = 36\ cm^2$

⇒ **$A(\overset{\triangle}{ADE}) = ?\ cm^2$**



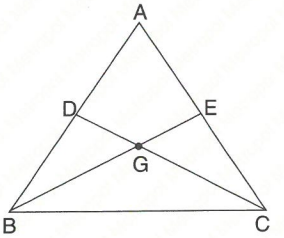

A) 6 B) 8 C) 9 D) 10 E) 12

**10.** G noktası ağırlık merkezidir.

G is center of the gravity.

$A(ADGE) = 16\ cm^2$

⇒ **$A(\overset{\triangle}{ABC}) = ?\ cm^2$**




A) 36 B) 40 C) 42 D) 46 E) 48

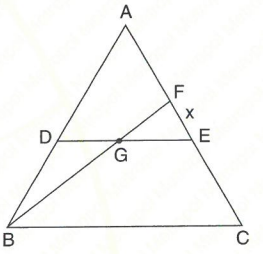
**11.** G noktası ağırlık merkezidir.

G is center of the gravity.

[DE] // [BC],

IACI = 24 cm

⇒ **IFEI = x = ? cm**




A) 1 B) 2 C) 3 D) 4 E) 5

**12.** G noktası ağırlık merkezidir.

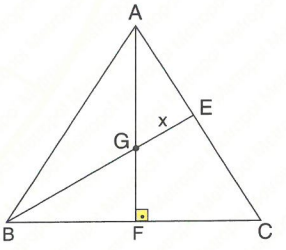
G is center of the gravity.

[AF] ⊥ [BC],

IAFI = 9 cm,

IBCI = 8 cm

⇒ **IGEI = x = ? cm**

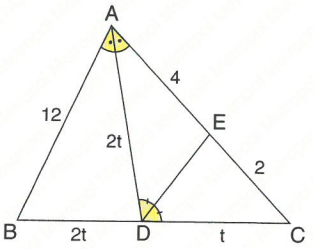



A) 2 B) $\frac{5}{2}$ C) 3 D) $\frac{7}{2}$ E) 4

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | B | B | C | A | D | A | C | C | E | D | B |

1.




Açıortay teoremi / The bisector theorem is

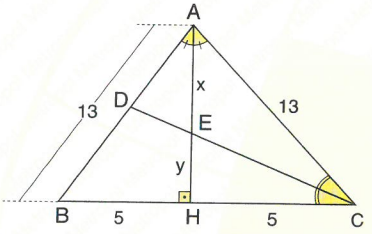
$(2t)^2 = 12\cdot 6 - 2t\cdot t$

$4t^2 = 72 - 2t^2 \Rightarrow 6t^2 = 72 \Rightarrow t^2 = 12 \Rightarrow t = 2\sqrt{3}$

$|BC| = x = 3t = 6\sqrt{3}$ cm

**Yanıt / Answer C**

2.




Açıortay teoremi / The bisector theorem is

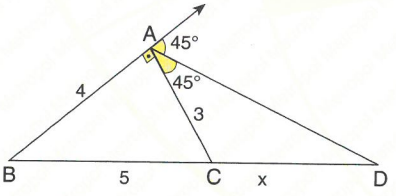
$\frac{|AE|}{|EH|} = \frac{|AC|}{|HC|} \Rightarrow \frac{x}{y} = \frac{13}{5} \Rightarrow y = \frac{5x}{13}$

$x + y = 12$ cm

$\frac{5x}{13} + x = 12 \Rightarrow x = \frac{12\cdot 13}{18} = \frac{26}{3}$ cm

**Yanıt / Answer B**

3.




$|BC|^2 = 3^2 + 4^2 \Rightarrow |BC| = 5$ cm [ Pythagor ]

[AD] bir dış açıortaydır. / [AD] is an exterior bisector.

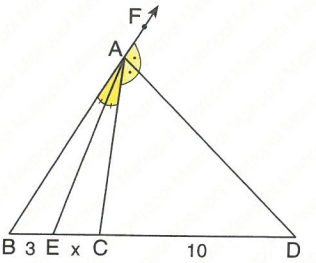
$\frac{x}{x+5} = \frac{3}{4} \Rightarrow 4x = 3x + 15 \Rightarrow x = 15$ cm

**Yanıt / Answer B**

4. [AE] bir iç açıortay,

[AD] bir dış açıortaydır.

[AE] is an interior bisector, [AD] is an exterior bisector.




$\frac{|AC|}{|AB|} = \frac{x}{3} = \frac{10}{x+13}$

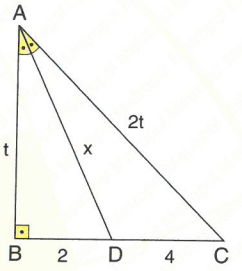
$x^2 + 13x = 30$

$x^2 + 13x - 30 = 0$

$(x + 15)\cdot(x - 2) = 0 \Rightarrow x = 2$ cm

**Yanıt / Answer C**

5.




[AD] bir açıortaydır. / [AD] is a bisector.

$\frac{|BD|}{|DC|} = \frac{|AB|}{|AC|} \Rightarrow \frac{|AB|}{|AC|} = \frac{2}{4} = \frac{1}{2}$

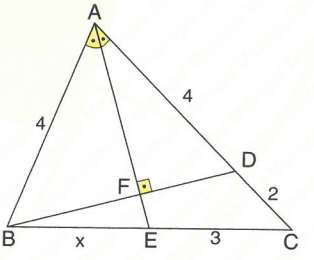
$(2t)^2 = t^2 + 6^2 \Rightarrow t^2 = 12$ [ Pythagor ]

$|AD|^2 = t^2 + 2^2$ [ Pythagor ]

$x^2 = 12 + 4 \Rightarrow x^2 = 16 \Rightarrow x = 4$ cm

**Yanıt / Answer A**

6.




$|BC|^2 = 3^2 + 4^2 \Rightarrow |BC| = 5$ cm [ Pythagor ]

$\left.\begin{array}{l} m(\widehat{BAF}) = m(\widehat{FAD}) \\ [AF] \perp [BD] \end{array}\right\} \Rightarrow |AB| = |AD| = 4$ cm

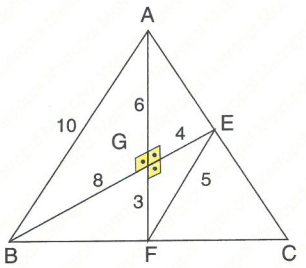
Açıortay teoreminden aşağıdaki orantı yazılabilir.

By using the median theorem, we can write following ratio.

$\frac{|AC|}{|AB|} = \frac{|EC|}{|BE|} \Rightarrow \frac{6}{4} = \frac{3}{x} \Rightarrow x = 2$ cm

**Yanıt / Answer D**

**7.**




G ağırlık merkezi, [EF] orta tabandır.

G is center of the gravity and [EF] is a middle base.

$|AB| = 2 \cdot 5 = 10$ cm

$|GE| = \frac{|BG|}{2} = \frac{8}{2} = 4$ cm

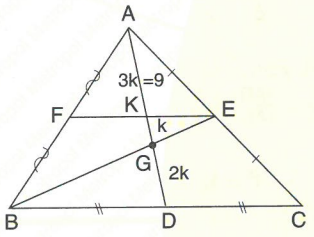
$|AG| = 2 \cdot |GF| = 2 \cdot 3 = 6$ cm

$|AE| = \sqrt{6^2 + 4^2} = \sqrt{52} = 2\sqrt{13}$ cm

$|EC| = |AE| = 2\sqrt{13}$ cm

**Yanıt / Answer A**

**8.**



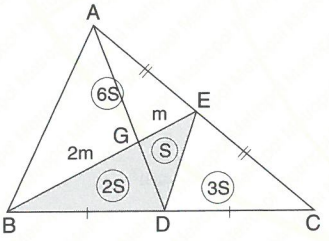

G ağırlık merkezi, [EF] orta tabandır.

G is center of the gravity and [EF] is a middle base.

$|AD| = 6 \cdot |KG| = 6 \cdot 3 = 18$ cm

**Yanıt / Answer C**

**9.**



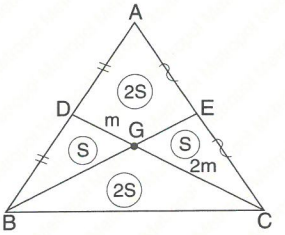

$A(\overset{\triangle}{ABC}) = 12S$

$36 = 12S \Rightarrow S = 3$ cm$^2$

$A(\overset{\triangle}{ABD}) = 3S = 3 \cdot 3 = 9$ cm$^2$

**Yanıt / Answer C**

**10.**

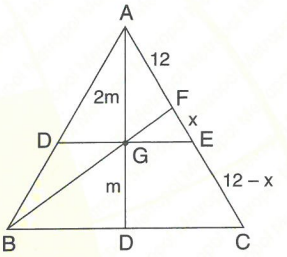



$2S = 16 \Rightarrow S = 8$ cm$^2$

$A(\overset{\triangle}{ABC}) = 6S = 48$ cm$^2$

**Yanıt / Answer E**

**11.**



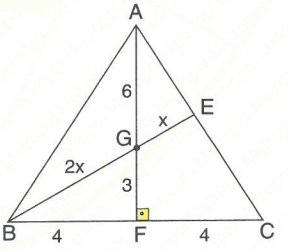

$\frac{|AG|}{|GD|} = \frac{12 + x}{12 - x}$

$\frac{2m}{m} = \frac{12 + x}{12 - x}$

$12 + x = 2 \cdot (12 - x) \Rightarrow x = 4$ cm

**Yanıt / Answer D**

**12.**




G noktası şekildeki ABC üçgeninin ağırlık merkezidir.

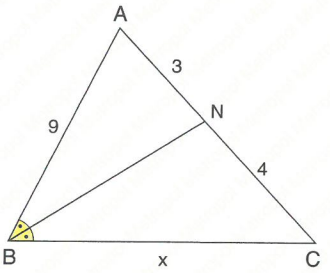
G is center of the gravity in the ABC triangle.

$|GB| = 2x = \sqrt{3^2 + 4^2}$ [ Pythagor ]

$|GB| = 2x = 5 \Rightarrow x = \frac{5}{2}$ cm

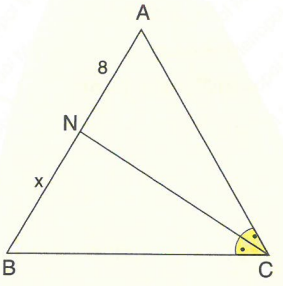
**Yanıt / Answer B**

**1.** ANI = 3 cm,
INCI = 4 cm,
IABI = 9 cm
⇒ **IBCI = x = ? cm**



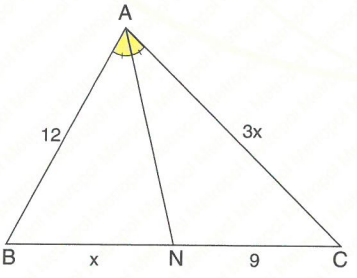

A) 10 B) 11 C) 12 D) 14 E) 15

**2.** $m(\widehat{ACN}) = m(\widehat{NCB})$,
5·IACI = 4·IBCI,
IANI = 8 cm
⇒ **INBI = x = ? cm**



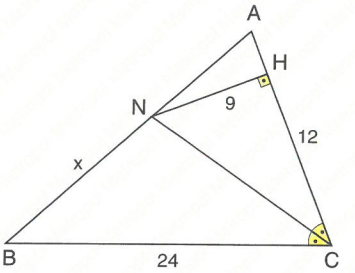

A) 8 B) 10 C) 12 D) 14 E) 16

**3.** $m(\widehat{BAN}) = m(\widehat{NAC})$,
INCI = 9 cm,
IABI = 12 cm,
IACI = 3x cm
⇒ **IBNI = x = ? cm**



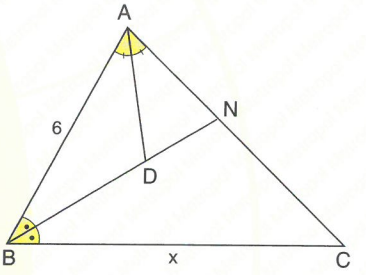

A) 3 B) 4 C) 5 D) 6 E) 8

**4.** $m(\widehat{ACN}) = m(\widehat{NCB})$,
[NH] ⊥ [AC],
IHCI = 12 cm,
INHI = 9 cm,
IBCI = 24 cm
⇒ **INBI = x = ? cm**



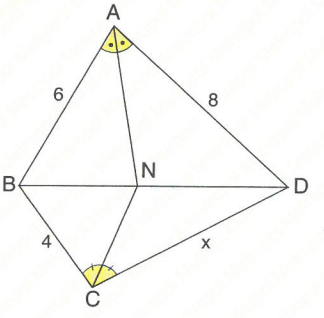

A) 10 B) 11 C) 12 D) 14 E) 15

**5.** $m(\widehat{ABN}) = m(\widehat{NBC})$,
$m(\widehat{BAD}) = m(\widehat{DAN})$,
$\frac{IDNI}{IBDI} = \frac{2}{3}$,
IABI = 6 cm,
IACI = 9 cm
⇒ **IBCI = x = ? cm**



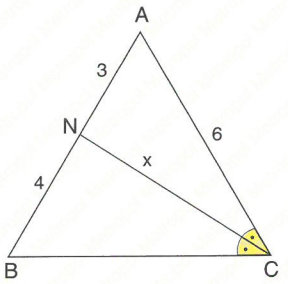

A) 7 B) $\frac{15}{2}$ C) 8 D) $\frac{17}{2}$ E) 9

**6.** $m(\widehat{BAN}) = m(\widehat{NAD})$,
$m(\widehat{BCN}) = m(\widehat{NCD})$,
IABI = 6 cm,
IADI = 8 cm,
IBCI = 4 cm
⇒ **ICDI = x = ? cm**



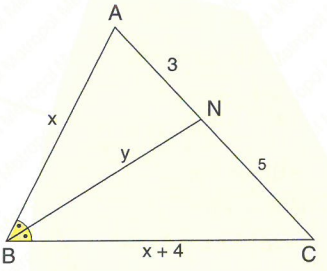

A) $\frac{16}{3}$ B) $\frac{20}{3}$ C) 8 D) 9 E) $\frac{21}{2}$

**7.** $m(\widehat{ACN}) = m(\widehat{NCB})$,
$|AN| = 3$ cm,
$|NB| = 4$ cm,
$|AC| = 6$ cm
$\Rightarrow$ **$|NC| = x = ?$ cm**



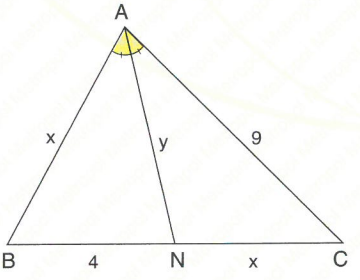

A) 5 B) 6 C) 7 D) 8 E) 9

**8.** $m(\widehat{ABN}) = m(\widehat{NBC})$,
$|AN| = 3$ cm,
$|NC| = 5$ cm,
$|AB| = x$ cm,
$|BC| = x + 4$ cm
$\Rightarrow$ **$|BN| = y = ?$ cm**



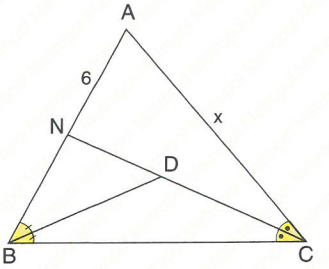

A) $\sqrt{5}$ B) $2\sqrt{5}$ C) $3\sqrt{5}$
D) $4\sqrt{5}$ E) $6\sqrt{5}$

**9.** $(\widehat{BAN}) = m(\widehat{NAC})$,
$|BN| = 4$ cm,
$|AC| = 9$ cm,
$|AB| = |NC| = x$ cm
$\Rightarrow$ **$|AN| = y = ?$ cm**



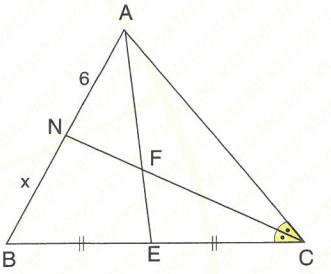

A) $\sqrt{5}$ B) $2\sqrt{5}$ C) $2\sqrt{3}$
D) $3\sqrt{3}$ E) $\sqrt{30}$

**10.** $m(\widehat{ACN}) = m(\widehat{NCB})$,
$m(NBD) = m(DBC)$,
$\frac{|ND|}{|DC|} = \frac{1}{2}$,
$|AN| = 6$ cm $\Rightarrow$
**$|AC| = x = ?$ cm**



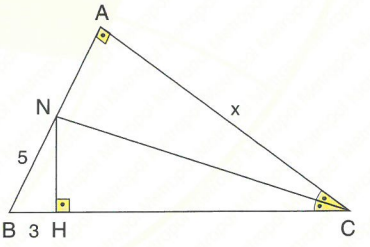

A) 8 B) 9 C) 10 D) 11 E) 12

**11.** $m(\widehat{ACN}) = m(\widehat{NCB})$,
$|BE| = |EC|$
$2 \cdot |AF| = 3 \cdot |EF|$
$|AN| = 6$ cm
$\Rightarrow$ **$|NB| = x = ?$ cm**




A) 5 B) 6 C) 7 D) 8 E) 9

**12.**



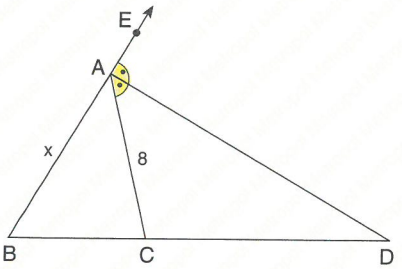

$[BA] \perp [CA]$, $[NH] \perp [BC]$, $|NB| = 5$ cm, $|BH| = 3$ cm
$\Rightarrow$ **$|AC| = x = ?$ cm**

A) 8 B) 10 C) 12 D) 14 E) 15

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | B | D | E | B | A | B | C | E | E | D | C |

**1.**

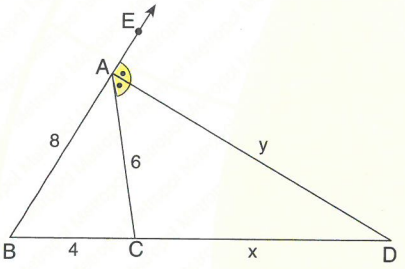



$m(\widehat{EAD}) = m(\widehat{DAC})$, $4 \cdot |BC| = |CD|$,

$|AC| = 8$ cm $\Rightarrow$ **$|AB| = x = ?$ cm**

A) 8 B) 9 C) 10 D) 11 E) 12

**2.**

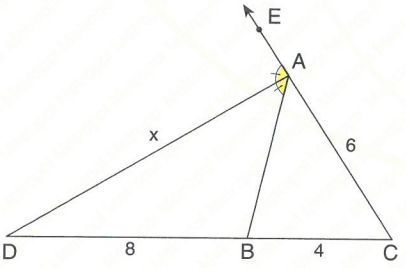



$m(\widehat{EAD}) = m(\widehat{DAC})$, $|AB| = 8$ cm, $|AC| = 6$ cm

$|BC| = 4$ cm, $|CD| = x$ cm, $|AD| = y$ cm $\Rightarrow$ **$x + y = ?$ cm**

A) 22 B) 24 C) 26 D) 28 E) 30

**3.**




$m(EAD) = m(DAB)$, $|AC| = 6$ cm, $|BC| = 4$ cm,

$|DB| = 8$ cm $\Rightarrow$ **$|AD| = x = ?$ cm**

A) $6\sqrt{2}$ B) $8\sqrt{2}$ C) $10\sqrt{2}$ D) $6\sqrt{3}$ E) $8\sqrt{3}$

**4.** $m(\widehat{KAE}) = m(\widehat{EAC})$,

$m(\widehat{RPF}) = m(\widehat{FPC})$,

$|AB| = 8$ cm,

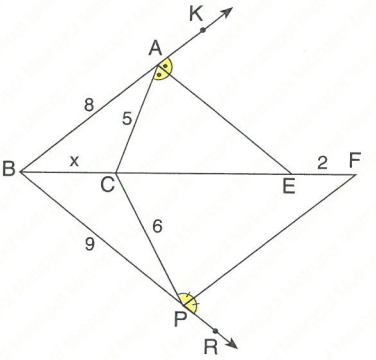
$|AC| = 5$ cm,

$|EF| = 2$ cm,

$|CP| = 6$ cm,

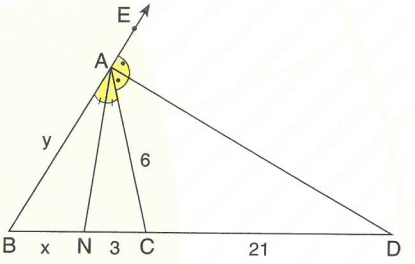
$|BP| = 9$ cm

$\Rightarrow$ **$|BC| = x = ?$ cm**




A) 2 B) 3 C) 4 D) 5 E) 6

**5.**



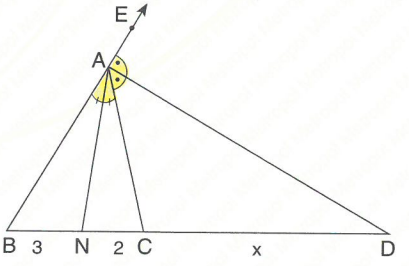

$m(\widehat{EAD}) = m(\widehat{DAC})$, $m(\widehat{BAN}) = m(\widehat{NAC})$, $|CD| = 21$ cm,

$|NC| = 3$ cm, $|AC| = 6$ cm, $|BN| = x$ cm, $|AB| = y$ cm

$\Rightarrow$ **$x + y = ?$ cm**

A) 8 B) 10 C) 12 D) 14 E) 16

**6.**

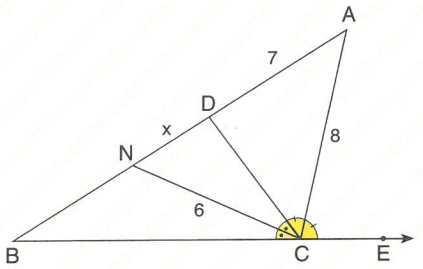



$m(\widehat{EAD}) = m(\widehat{DAC})$, $m(\widehat{CAN}) = m(\widehat{NAB})$, $|NC| = 2$ cm,

$|BN| = 3$ cm $\Rightarrow$ **$|CD| = x = ?$ cm**

A) 6 B) 7 C) 8 D) 9 E) 10

**7.**




$m(\widehat{ECA}) = m(\widehat{ACD})$, $m(\widehat{DCN}) = m(\widehat{NCB})$, $|AD| = 7$ cm,

$|AC| = 8$ cm $|NC| = 6$ cm $\Rightarrow$ **$|ND| = x = ?$ cm**

A) 2 B) 3 C) 4 D) 5 E) 6

**8.** $m(\widehat{CAD}) = m(\widehat{DAB})$,

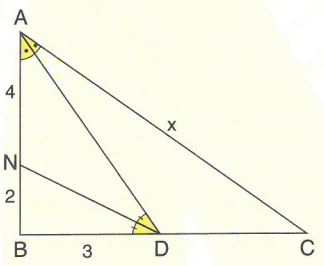
$m(\widehat{ADN}) = m(\widehat{NDB})$,

$|AN| = 4$ cm,

$|NB| = 2$ cm,

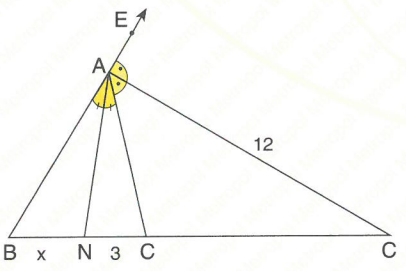
$|BD| = 3$ cm

$\Rightarrow$ **$|AC| = x = ?$ cm**




A) 8 B) 9 C) 10 D) 11 E) 12

**9.**

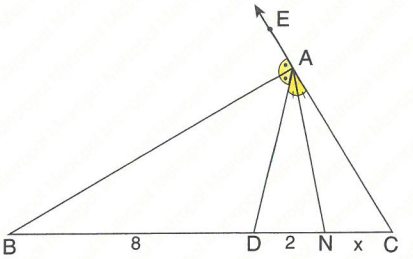



$m(\widehat{BAN}) = m(\widehat{NAC})$, $m(\widehat{EAD}) = m(\widehat{DAC})$, $2 \cdot |AN| = |DC|$,

$|AD| = 12$ cm, $|NC| = 3$ cm $\Rightarrow$ **$|BN| = x = ?$ cm**

A) $\frac{23}{7}$ B) $\frac{27}{7}$ C) $\frac{12}{5}$ D) $\frac{23}{5}$ E) $\frac{39}{7}$

**10.**

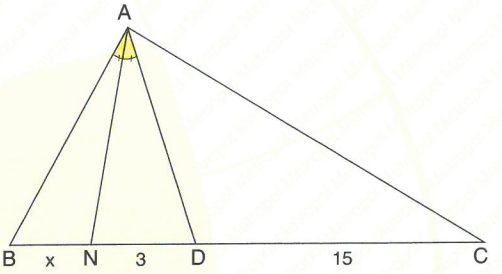



$m(\widehat{EAB}) = m(\widehat{BAD})$, $m(\widehat{DAN}) = m(\widehat{NAC})$, $|BD| = 8$ cm,

$|DN| = 2$ cm $\Rightarrow$ **$|NC| = x = ?$ cm**

A) 3 B) $\frac{10}{3}$ C) $\frac{12}{5}$ D) 4 E) $\frac{20}{3}$

**11.**

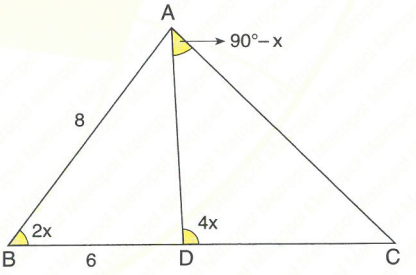



$m(\widehat{ANC}) + m(\widehat{ACN}) = 90°$, $m(\widehat{BAN}) = m(\widehat{NAD})$,

$|DC| = 15$ cm, $|ND| = 3$ cm $\Rightarrow$ **$|BN| = x = ?$ cm**

A) 2 B) $\frac{7}{2}$ C) 4 D) $\frac{9}{2}$ E) 5

**12.**




$m(\widehat{ABC}) = 2x$, $m(\widehat{ADC}) = 4x$, $m(\widehat{DAC}) = 90° - x$,

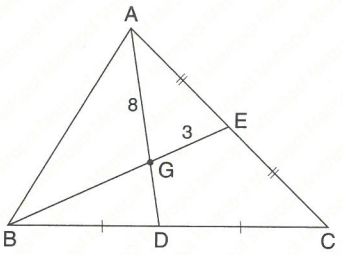
$|BD| = 6$ cm, $|AB| = 8$ cm $\Rightarrow$ **$|AC| = ?$ cm**

A) $4\sqrt{3}$ B) $8\sqrt{3}$ C) $4\sqrt{6}$ D) $6\sqrt{6}$ E) $8\sqrt{6}$

**YANITLAR / ANSWERS**

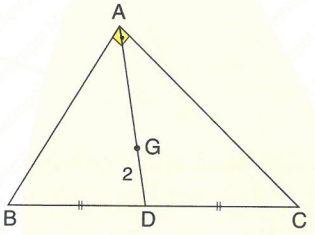
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | B | A | E | C | E | B | A | E | B | D | E |

**1.** IAEI = IECI,
IBDI = IDCI,
IAGI = 8 cm,
IGEI = 3 cm
⇒ **IGDI + IBGI = ? cm**



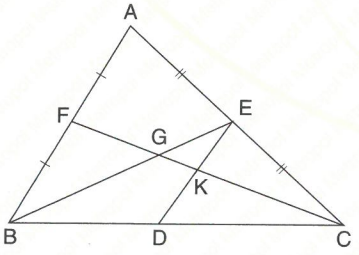

A) 8 B) 9 C) 10 D) 11 E) 12

**2.** IBDI = IDCI,
[AB] ⊥ [AC],
IGDI = 2 cm
⇒ **IBCI = ? cm**




A) 6 B) 8 C) 10 D) 12 E) 14

**3.**

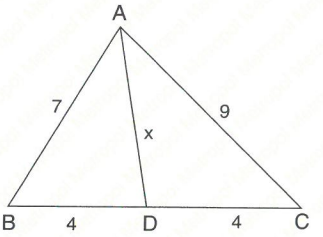



IAEI = IECI, IAFI = IFBI, [ED] // [AB]

⇒ $\dfrac{\text{IFGI + IKCI}}{\text{IGKI + ICFI}}$ = ?

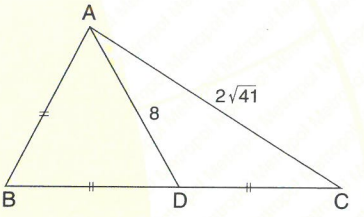
A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{2}{5}$ D) $\frac{4}{7}$ E) $\frac{5}{7}$

**4.** IBDI = IDCI = 4 cm,
IABI = 7 cm,
IACI = 9 cm
⇒ **IADI = x = ? cm**




A) 5 B) 6 C) 7 D) 8 E) 9

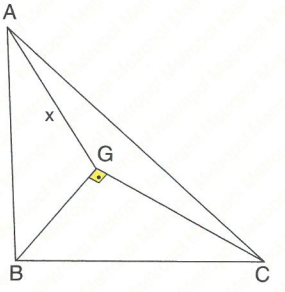
**5.**




IABI = IBDI = IDCI, IACI = $2\sqrt{41}$ cm, IADI = 8 cm
⇒ **IBCI = ? cm**

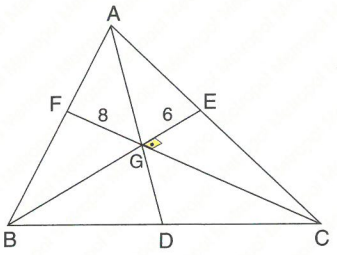
A) 10 B) 12 C) 14 D) 16 E) 18

**6.** G ağırlık merkezidir.
G is center of gravity.
[BG] ⊥ [GC],
IBCI = 12 cm
⇒ **IAGI = x = ? cm**




A) 6 B) 8 C) 9 D) 10 E) 12

**7.**

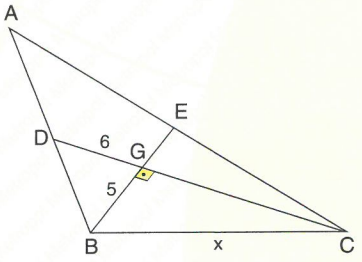



G ağırlık merkezidir. / G is center of gravity.

[EB] ⊥ [FC], IGEI = 6 cm, IFGI = 8 cm ⇒ **IADI = ? cm**

A) 18 B) 20 C) 24 D) 28 E) 30

**8.**



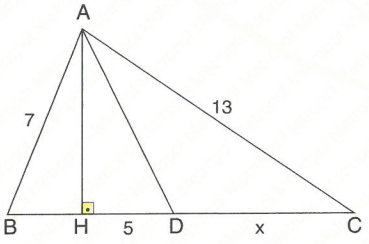

G ağırlık merkezidir. / G is center of gravity.

[BE] ⊥ [DC], IBGI = 5 cm, IDGI = 6 cm

⇒ **IBCI = x = ? cm**

A) 8 B) 10 C) 12 D) 13 E) 15

**9.**

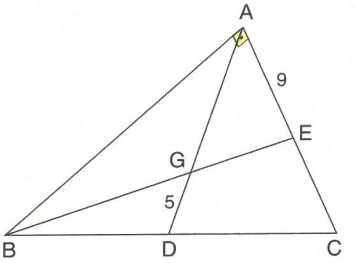



[AH] ⊥ [BC], IBDI = IDCI, IABI = 7 cm, IACI = 13 cm,

IHDI = 5 cm ⇒ **IDCI = x = ? cm**

A) 6 B) 7 C) 8 D) 9 E) 10

**10.**

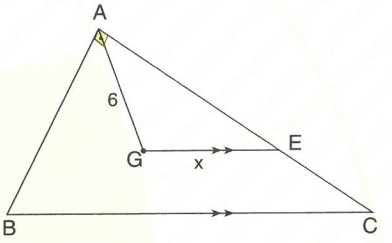



G ağırlık merkezidir. / G is center of gravity.

[BA] ⊥ [AC], IGDI = 5 cm, IAEI = 9 cm ⇒ **IABI = ? cm**

A) 18 B) 20 C) 22 D) 24 E) 28

**11.**

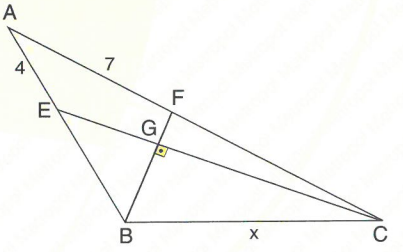



G noktası ağırlık merkezidir. / G is center of gravity.

[GE] ⊥ [BC], [AB] ⊥ [AC], IAGI = 6 cm ⇒ **IGEI = x = ? cm**

A) 4 B) 5 C) 6 D) 8 E) 9

**12.**




G ağırlık merkezidir. / G is center of gravity.

[BF] ⊥ [EC], IAFI = 7 cm, IAEI = 4 cm ⇒ **IBCI = x = ? cm**

A) $2\sqrt{3}$ B) $3\sqrt{3}$ C) $2\sqrt{5}$ D) $3\sqrt{5}$ E) $2\sqrt{13}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | D | E | C | B | E | E | D | A | D | C | E |

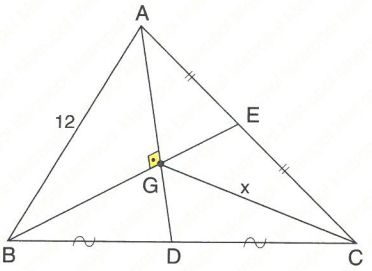
**1.** [AD] ⊥ [BE]

IAEI = IECI,

IBDI = IDCI,

IABI = 12 cm

⇒ **IGCI = x = ? cm**



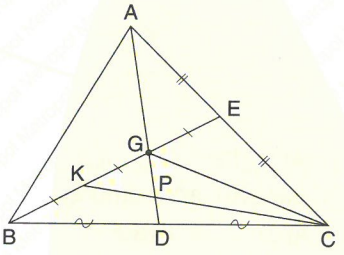

A) 10 B) 12 C) 14 D) 16 E) 18

**2.** IAEI = IECI,

IBDI = IDCI,

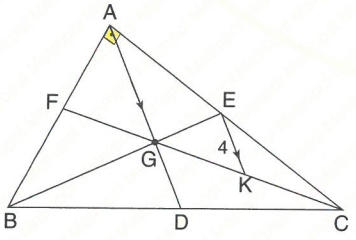
IBKI = IKGI = IGEI

⇒ $\frac{\text{IPDI}}{\text{IAGI}}$ = ?




A) $\frac{1}{6}$ B) $\frac{1}{4}$ C) $\frac{1}{3}$ D) $\frac{2}{9}$ E) $\frac{1}{2}$

**3.**




G ağırlık merkezidir. / G is center of gravity.

[EK] // [AD], IEKI = 4 cm ⇒ **IBCI = ? cm**

A) 12 B) 16 C)18 D) 20 E) 24

**4.** G ağırlık merkezidir.

G is center of gravity.

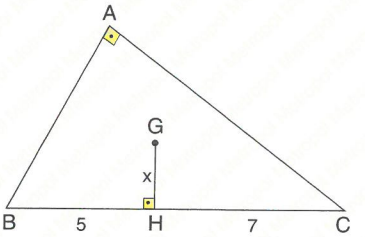
[BA] ⊥ [AC],

[GH] ⊥ [BC],

IBHI = 5 cm,

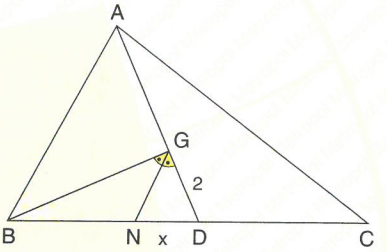
IHCI = 7 cm

⇒ **IGHI = x = ? cm**




A) $\frac{1}{2}$ B) $\frac{2}{3}$ C) 1 D) $\sqrt{2}$ E) $\sqrt{3}$

**5.**



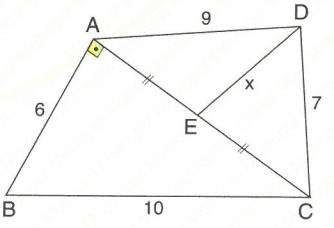

G ağırlık merkezidir. / G is center of gravity.

IADI = IBGI, IBCI = 18 cm, IGDI = 2 cm

⇒ **INDI = x = ? cm**

A) $\frac{9}{4}$ B) $\frac{7}{4}$ C) $\frac{7}{3}$ D) $\frac{7}{2}$ E) $\frac{9}{2}$

**6.**




[BA] ⊥ [AC], IAEI = IECI, IABI = 6 cm, IBCI = 10 cm,

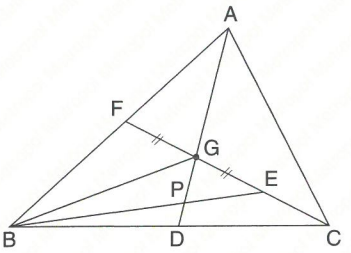
IADI = 9 cm, IDCI = 7 cm ⇒ **IEDI = x = ? cm**

A) $\sqrt{47}$ B) 7 C) $2\sqrt{13}$

D) $\sqrt{57}$ E) 8

**7.** G ağırlık merkezidir.
G is center of gravity.

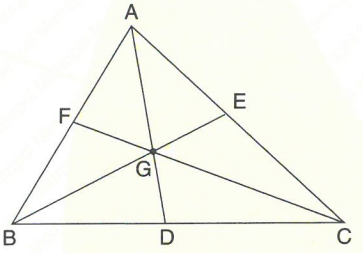
IFGI = IGEI,
IADI = 18 cm.
⇒ **IGPI = ? cm**




A) 2 B) 3 C) 4 D) 5 E) 6

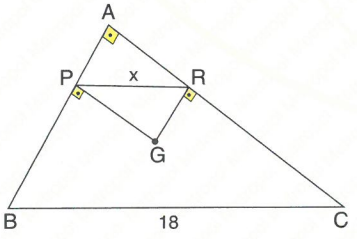
**8.** G ağırlık merkezidir.
G is center of gravity.

IABI = 4 cm,
IBCI = 6 cm,
IACI = 8 cm,
IADI = $V_a$,
IBEI = $V_b$,
ICFI = $V_c$ ⇒ $\mathbf{V_a^2 + V_b^2 + V_c^2 = ?}$




A) 64 B) 72 C) 76 D) 81 E) 87

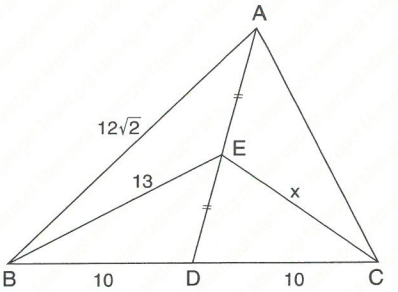
**9.**




G ağırlık merkezidir. / G is center of gravity.
[AB] ⊥ [AC], [GP] ⊥ [AB], [AC] ⊥ [GR], IBCI = 18 cm
⇒ **IPRI = x = cm ?**

A) 6 B) 7 C) 8 D) 9 E) 10

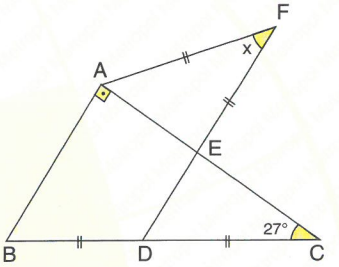
**10.**




IBDI = IDCI = 10 cm, IEDI = IEAI, IBEI = 13 cm,
IABI = $12\sqrt{2}$ cm ⇒ **IECI = x = ? cm**

A) 8 B) 9 C) 10 D) 11 E) 12

**11.**

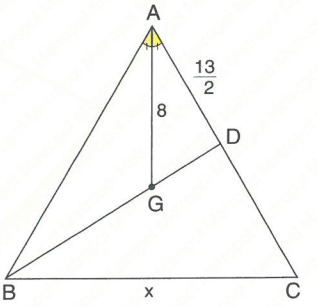



IAFI = IFEI = IDCI = IBDI, [AB] ⊥ [AC],
m($\widehat{ACB}$) = 27° ⇒ **m($\widehat{AFE}$) = x = ?**

A) 27° B) 30° C) 35° D) 42° E) 54°

**12.** G ağırlık merkezidir.
G is center of gravity.

m($\widehat{BAG}$) = m($\widehat{GAD}$),
IAGI = 8 cm
IADI = $\frac{13}{2}$ cm
⇒ **IBCI = x = ? cm**

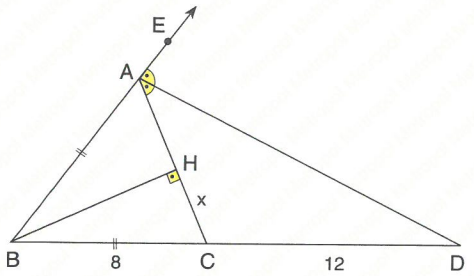



A) 8 B) 9 C) 10 D) 11 E) 12

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | A | E | E | A | B | C | E | A | B | D | C |

**1.**




IABI = IBCI = 8 cm, [BH] ⊥ [AC],

ICDI = 12 cm ⇒ **IHCI = x = ? cm**

A) $\frac{12}{5}$ B) $\frac{16}{3}$ C) $\frac{18}{5}$ D) $\frac{22}{3}$ E) $\frac{24}{5}$

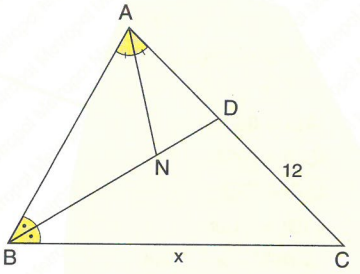
**2.** $m(\widehat{DAN}) = m(\widehat{NAB})$,

$m(\widehat{ABD}) = m(\widehat{DBC})$,

3·INDI = 2·IBNI

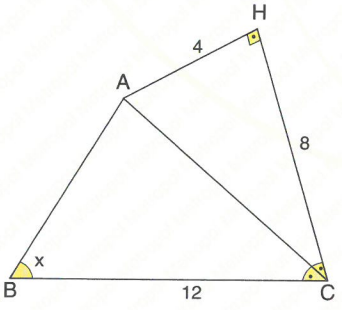
IDCI = 12 cm

⇒ **IBCI = x = ? cm**




A) 12 B) 16 C) 18 D) 20 E) 24

**3.**




$m(\widehat{BCA}) = m(\widehat{ACH})$, [AH] ⊥ [HC], IHCI = 8 cm,

IAHI = 4 cm, IBCI = 12 cm ⇒ **$m(\widehat{ABC})$ = x = ?**

A) 15° B) 30° C) 45° D) 60° E) 75°

**4.** [AB] ⊥ [AD],

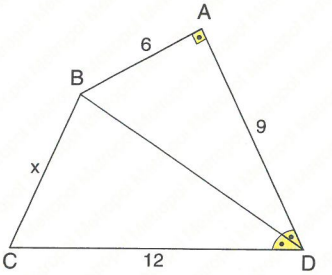
$m(\widehat{ADB}) = m(\widehat{BDC})$,

IABI = 6 cm,

IADI = 9 cm,

IDCI = 12 cm

⇒ **IBCI = x = ? cm**




A) $3\sqrt{2}$ B) $5\sqrt{2}$ C) $3\sqrt{3}$ D) $5\sqrt{3}$ E) $3\sqrt{5}$

**5.** $m(\widehat{ABC}) = m(\widehat{CBD})$,

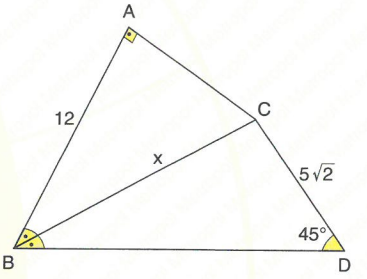
[BA] ⊥ [CA],

ICDI = $5\sqrt{2}$ cm,

IABI = 12 cm

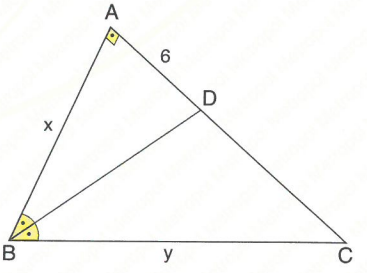
$m(\widehat{BDC}) = 45°$

⇒ **IBCI = x = ? cm**




A) 13 B) 14 C) 15 D) 16 E) 18

**6.**

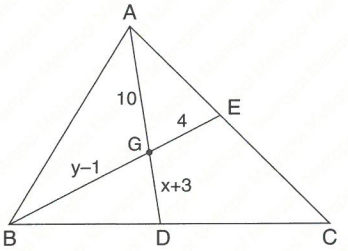



[BA] ⊥ [CA], [AB] ⊥ [AD], $m(\widehat{ABD}) = m(\widehat{DBC})$, IADI = 6 cm,

IABI = x cm, IBCI = y cm, y – x = 8 cm ⇒ **IDCI = ? cm**

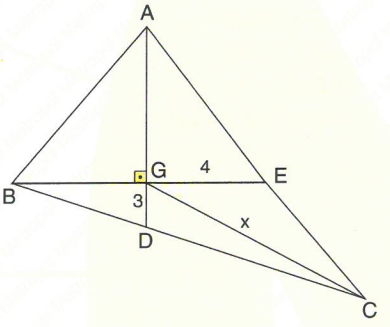
A) 6 B) 7 C) 8 D) 9 E) 10

**7.** G ağırlık merkezidir.
G is center of gravity.
IGDI = x + 3,
IAGI = 10 cm
IGEI = 4 cm,
IBGI = y – 1
⇒ **x + y = ? cm**



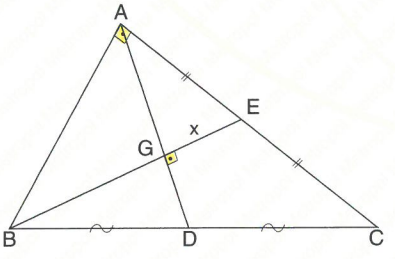

A) 8 B) 9 C) 10 D) 11 E) 12

**8.** G ağırlık merkezidir.
G is center of gravity.
[AD] ⊥ [BE],
IEGI = 4 cm,
IGDI = 3 cm
⇒ **IGCI = x = ? cm**




A) 8 B) 9 C) 10 D) 11 E) 12

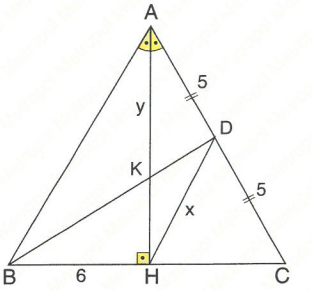
**9.**




IAEI = IECI, IBDI = IDCI, IBCI = 12 cm, [AG] ⊥ [BE],
⇒ **IGEI = x = ? cm**

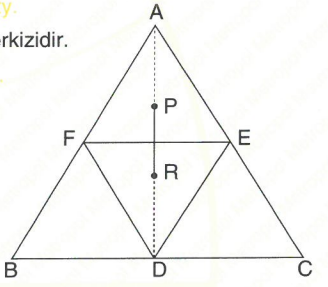
A) $\sqrt{2}$ B) 2 C) 3 D) $2\sqrt{2}$ E) 4

**10.** [AH] ⊥ [BC],
$m(\widehat{BAH}) = m(\widehat{HAC})$,
IADI = IDCI = 5 cm,
IBHI = 6 cm
⇒ **x + y = ? cm**



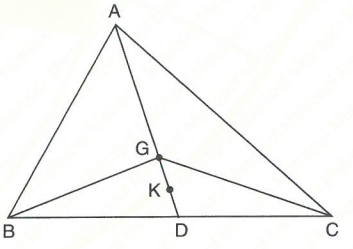

A) 8 B) $\frac{25}{3}$ C) 9 D) $\frac{28}{3}$ E) $\frac{31}{3}$

**11.** P AFE üçgenin ağırlık merkezidir.
P and R are center of gravity.
R FED üçgeninin ağırlık merkizidir.
R FED are center of gravity.
IAEI = IECI,
IBDI = IDCI,
IAFI = IFBI,
IADI = 24 cm
⇒ **IPRI = x = ? cm**




A) 4 B) 6 C) 8 D) 10 E) 12

**12.**



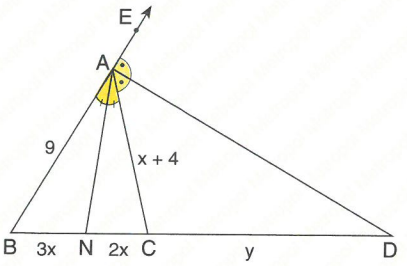

G ve K ağırlık merkezidir. / G and K are center of gravity. IGKI = 4 cm ⇒ **IADI = ? cm**

A) 8 B) 12 C) 16 D) 18 E) 24

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | C | C | E | A | E | D | C | D | E | C | D |

**1.**




$m(\widehat{EAD}) = m(\widehat{DAC})$, $m(\widehat{BAN}) = m(\widehat{NAC})$, $|AC| = x + 4$ cm

$|AB| = 9$ cm, $|BN| = 3x$ cm, $|NC| = 2x$ cm

$\Rightarrow$ **$|DC| = y = ?$ cm**

A) 12 B) 15 C) 18 D) 20 E) 24

**2.**

$[AH] \perp [BC]$

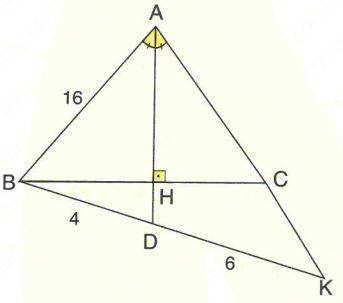
$|AB| = 12$ cm

$|AD| = 12$ cm

$|BD| = 42$ cm

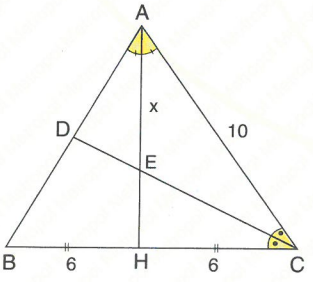
$|DK| = 6$ cm

$\Rightarrow$ $|CK| = ?$cm




A) 18 B) 21 C) 24 D) 25 E) 27

**3.**

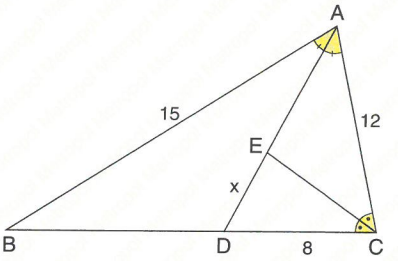



$m(\widehat{ACD}) = m(\widehat{DCB})$, $|BH| = |HC| = 6$ cm, $|AC| = 10$ cm,

$\Rightarrow$ **$|AE| = x = ?$ cm**

A) 3 B) 4 C) 5 D) 6 E) 7

**4.**

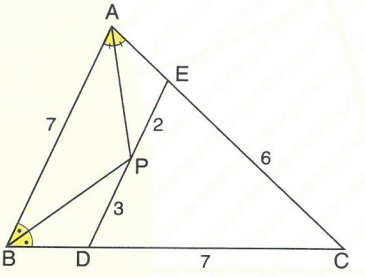



$m(\widehat{BAD}) = m(\widehat{DAC})$, $m(\widehat{ACE}) = m(\widehat{ECD})$, $|AB| = 15$ cm,

$|AC| = 12$ cm, $|DC| = 8$ cm $\Rightarrow$ **$|ED| = x = ?$ cm**

A) 1 B) 2 C) 3 D) 4 E) 5

**5.**



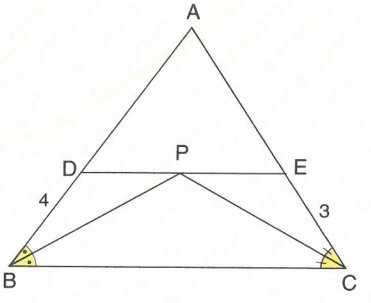

$[DE] \parallel [AB]$, $m(\widehat{BAP}) = m(\widehat{PAE})$, $m(\widehat{ABP}) = m(\widehat{PBD})$,

$|EP| = 2$ cm, $|PD| = 3$ cm, $|AB| = |DC| = 7$ cm, $|EC| = 6$ cm

$\Rightarrow$ **Çevre / The perimeter ($\overset{\triangle}{ABC}$) = ? cm**

A) 24 B) 25 C) 26 D) 28 E) 30

**6.**

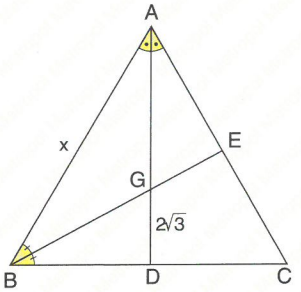



$[DE] \parallel [BC]$, $m(\widehat{ABP}) = m(\widehat{PBC})$, $m(\widehat{ACP}) = (\widehat{PCB})$,

$|DB| = 4$ cm, $|EC| = 3$ cm $\Rightarrow$ **$|DE| = ?$ cm**

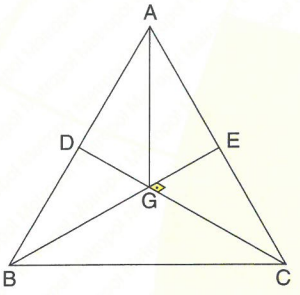
A) 5 B) 6 C) 7 D) 8 E) 9

**7.** G ağırlık merkezidir.
G is center of gravity.
$m(\widehat{BAD}) = m(\widehat{DAC})$,
$m(\widehat{ABE}) = m(\widehat{EBC})$,
$|GD| = 2\sqrt{3}$ cm
$\Rightarrow$ **$|AB| = x = ?$ cm**




A) $4\sqrt{3}$ B) 6 C) $6\sqrt{3}$ D) 12 E) $8\sqrt{3}$

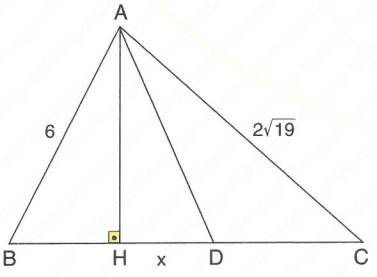
**8.**




G ağırlık merkezidir. / G is center of gravity.
$[AB] \perp [AC]$, $[AG] \perp [BD]$, $|AB| = 4\sqrt{6}$ cm
$\Rightarrow$ **$|BC| = x = ?$ cm**

A) $8\sqrt{2}$ B) $10\sqrt{2}$ C) $8\sqrt{6}$ D) $10\sqrt{6}$ E) $12\sqrt{2}$

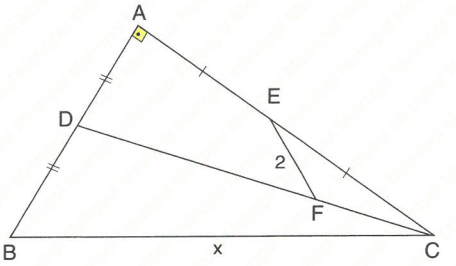
**9.**




$[AH] \perp [BC]$, $|BD| = |DC|$, $|AB| = 6$ cm, $|AC| = 2\sqrt{19}$ cm
$|BC| = 10$ cm $\Rightarrow$ **$|PR| = x = ?$ cm**

A) 1 B) $\frac{3}{2}$ C) 2 D) $\frac{5}{2}$ E) 3

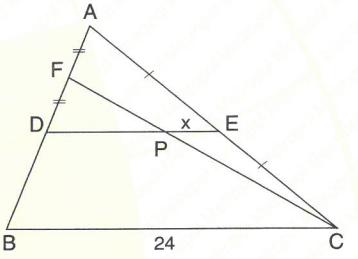
**10.**




$[BA] \perp [AC]$, $|AD| = |DB|$, $|AE| = |EC|$, $2 \cdot |FC| = |DF|$,
$|EF| = 2$ cm $\Rightarrow$ **$|BC| = x = ?$ cm**

A) 6 B) 8 C) 10 D) 12 E) 16

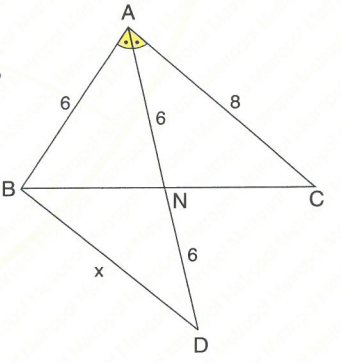
**11.**




$|AE| = |EC|$ , $|AF| = |FD|$, $[DE] \,//\, [BC]$,
$|BC| = 24$ cm $\Rightarrow$ **$|EP| = x = ?$ cm**

A) 2 B) $\frac{5}{2}$ C) 3 D) $\frac{7}{2}$ E) 4

**12.** $m(\widehat{BAN}) = m(\widehat{NAC})$,
$|AB| = |AN| = |ND| = 6$ cm,
$|AC| = 8$ cm
$\Rightarrow$ **$|BD| = x = ?$ cm**




A) $4\sqrt{3}$ B) $6\sqrt{3}$ C) $3\sqrt{6}$ D) $4\sqrt{6}$ E) 9

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | C | C | D | B | C | D | C | C | D | E | C |

# BÖLÜM CHAPTER 4

## TARİHSEL NOT / HISTORICAL NOTE

### Pisagor (Pythagoras) [570 – 495 BC]

İyonyalı matematikçi, filozof, ve Pisagorculuk olarak bilinen akımın kurucusudur. En iyi bilinen önermesi, kendi adıyla anılan Pisagor teoremidir. "Sayıların babası" olarak bilinir. Pisagor ve öğrencileri her şeyin matematikle ilgili olduğuna, sayıların nihâî gerçek olduğuna, matematik aracılığıyla her şeyin tahmin edilebileceğine ve ölçülebileceğine inanmışlardır.

Ionian mathematician, philosopher, and founder of the trend currently known as Pythagoras. His best known proposition is the Pythagorean theorem, which is called by its name. He is known as the "father of numbers". Pythagoras and his students believed that everything was related to mathematics, numbers were the ultimate truth, and everything could be predicted and measured through mathematics.

# ÖZEL ÜÇGENLER
# SPECIAL TRIANGLES

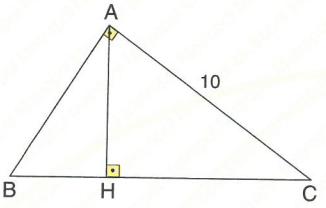
**Bu bölüm 132 çözümlü test sorusu ve 36 test sorusu içermektedir.**

This chapter includes 132 test questions with solutions and 36 test questions.

**BÖLÜM / CHAPTER 4**

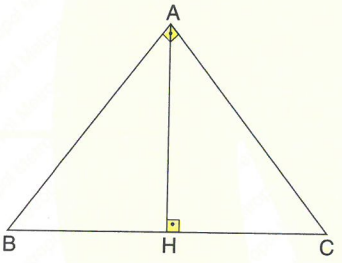
**ÖZEL ÜÇGENLER / SPECIAL TRIANGLES**

**1.** $[AB] \perp [AC]$,
$[AH] \perp [BC]$,
$|HC| = 4 \cdot |BH|$,
$|AC| = 10$ cm
$\Rightarrow$ **$|AB| = ?$ cm**



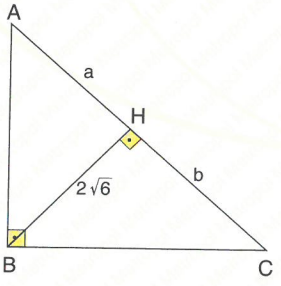

A) 8 B) 6 C) 5 D) 4 E) 3

**2.** $[AB] \perp [AC]$,
$[AH] \perp [BC]$,
$\frac{|BH|}{|HC|} = \frac{4}{5}$
$\Rightarrow$ **$\frac{|AB|}{|BC|} = ?$**



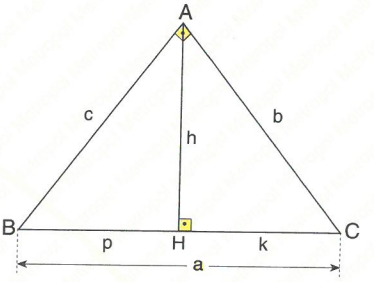

A) $\frac{1}{2}$ B) $\frac{2}{3}$ C) $\frac{3}{4}$ D) $\frac{3}{2}$ E) 2

**3.** $m(\widehat{ABC}) = 90°$,
$[BH] \perp [AC]$,
$|BH| = 2\sqrt{6}$ cm,
$|AH| = a$ cm,
$|HC| = b$ cm,
$a^2 + b^2 = 52$ cm$^2$
$\Rightarrow$ **$A(ABC) = ?$ cm$^2$**



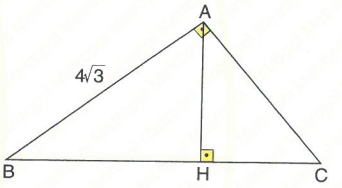

A) $6\sqrt{3}$ B) $8\sqrt{3}$ C) $10\sqrt{3}$ D) $8\sqrt{6}$ E) $10\sqrt{6}$

**4.** $m(\widehat{A}) = 90°$,
$[AH] \perp [BC]$,
$c^2 = 10 \cdot h$,
$k = 2h$
$\Rightarrow$ **$a = ?$ cm**



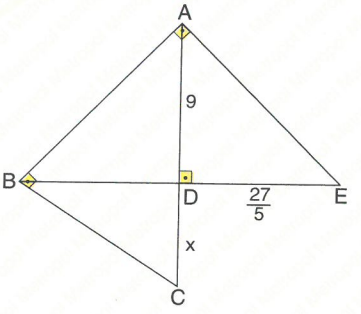

A) 25 B) 20 C) 15 D) 10 E) 5

**5.** $[AB] \perp [AC]$,
$[AH] \perp [BC]$,
$\frac{|BH|}{|HC|} = 3$,
$|AB| = 4\sqrt{3}$ cm
$\Rightarrow$ **$|AC| = ?$ cm**



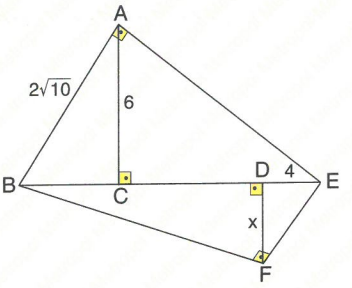

A) 4 B) $4\sqrt{2}$ C) 6 D) 8 E) $6\sqrt{2}$

**6.** $[AB] \perp [AE]$,
$[AB] \perp [BC]$,
$[AC] \perp [BE]$,
$|AD| = 9$ cm,
$|DE| = \frac{27}{5}$ cm
$\Rightarrow$ **$|DC| = x = ?$ cm**



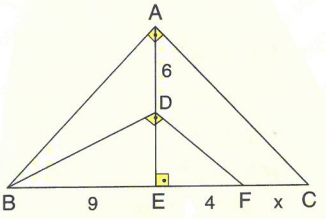

A) 15 B) 20 C) 25 D) 30 E) 35

**7.** [AB] ⊥ [AE],
[AC] ⊥ [BE],
[BF] ⊥ [FE],
[FD] ⊥ [BE],
IABI = $2\sqrt{10}$ cm,
IACI = 6 cm,
IDEI = 4 cm
⇒ **IDFI = x = ? cm**



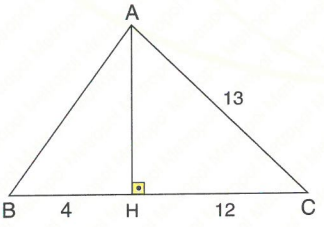

A) 18 B) 16 C) 12 D) 10 E) 8

**8.** [AB] ⊥ [AC],
[BD] ⊥ [DF],
[AE] ⊥ [BC],
IBEI = 9 cm,
IEFI = 4 cm,
IADI = 6 cm
⇒ **IFCI = x = ? cm**



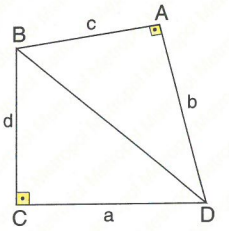

A) 10 B) 12 C) 14 D) 16 E) 20

**9.** [AH] ⊥ [BC],
IACI = 13 cm,
IHCI = 12 cm,
IBHI = 4 cm
⇒ **IABI = ? cm**



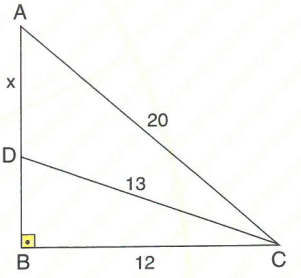

A) 3 B) 5 C) 13 D) $\sqrt{41}$ E) $\sqrt{51}$

**10.** $a^2 + b^2 + c^2 + d^2 = 128\ cm^2$
⇒ **IBDI = ? cm**



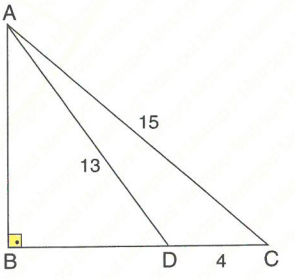

A) 6 B) 8 C) $8\sqrt{2}$ D) 2 E) $12\sqrt{2}$

**11.** [AB] ⊥ [BC],
IACI = 20 cm,
IBCI = 12 cm,
IDCI = 13 cm
⇒ **IADI = x = ?**




A) 9 B) 10 C) 11 D) 12 E) 13

**12.** m($\widehat{ABC}$) = 90°,
IACI = 15 cm,
IADI = 13 cm,
IDCI = 4 cm
⇒ **IABI = ? cm**

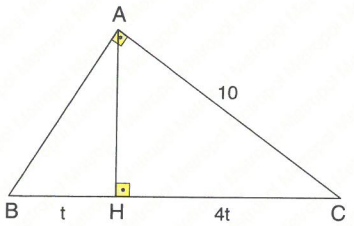



A) 4 B) 5 C) 6 D) 8 E) 12

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | B | E | B | A | C | E | B | D | B | C | E |

**1.**

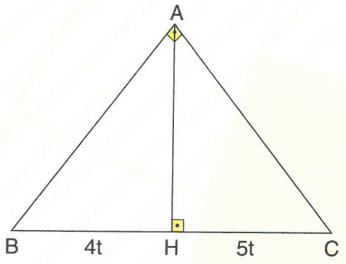



$10^2 = 4t \cdot 5t \Rightarrow t^2 = 5$ [ Euclid ]

$|AB|^2 = t \cdot 5t \Rightarrow |AB|^2 = 5t^2 = 25 \Rightarrow |AB| = 5$ cm

**Yanıt / Answer C**

**2.**




$|AH|^2 = 4t \cdot 5t = 20t^2$ [ Euclid ]

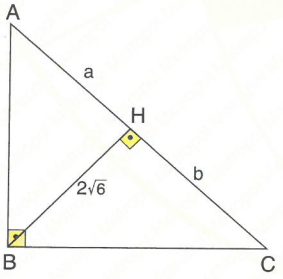
$|AH| = 2\sqrt{5}t$

$|AB| = \sqrt{16t^2 + 20t^2} = 6t$ [ Pythagor]

$\frac{|AB|}{|BC|} = \frac{6t}{9t} = \frac{2}{3}$

**Yanıt / Answer B**

**3.**




$a^2 + b^2 = 52$ cm$^2$

$|BH|^2 = a \cdot b \Rightarrow a \cdot b = 24$ [ Euclid ] $\Rightarrow$

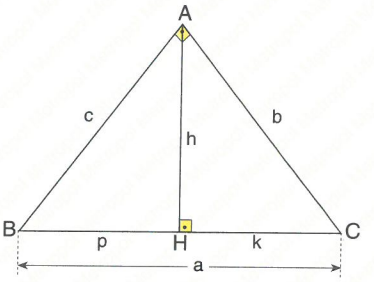
$(a + b)^2 = a^2 + b^2 + 2ab$

$(a + b)^2 = 100 \Rightarrow a + b = 10$ cm

$A(\widehat{ABC}) = \frac{2\sqrt{6} \cdot 10}{2} = 10\sqrt{6}$ cm$^2$

**Yanıt / Answer E**

**4.**



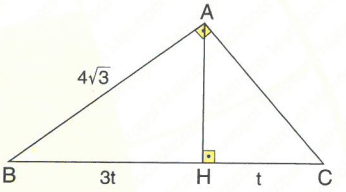

$\left.\begin{array}{l} c^2 = 10 \cdot h \Rightarrow c^2 = 10h \\ c^2 = p \cdot a \end{array}\right\} \Rightarrow p \cdot a = 10h$

$\left.\begin{array}{l} k = 2h \\ h^2 = p \cdot k \end{array}\right\} \Rightarrow h^2 = p \cdot 2h \Rightarrow h = 2p$

$p \cdot a = 10 \cdot 2p \Rightarrow a = 20$ cm

**Yanıt / Answer B**

**5.**



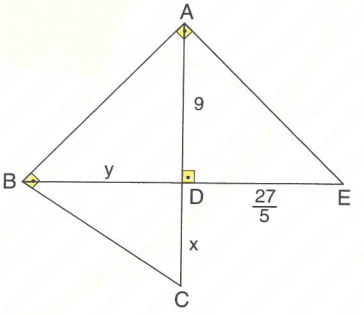

$(4\sqrt{3})^2 = 3t \cdot 4t$ [ Euclid ]

$48 = 12t^2 \Rightarrow t^2 = 4 \Rightarrow t = 2$ cm

$|AC|^2 = t \cdot 4t = 4t^2 = 16 \Rightarrow |AC| = 4$ cm

**Yanıt / Answer A**

**6.**




$9^2 = \frac{27}{5} \cdot y$ [ Euclid]

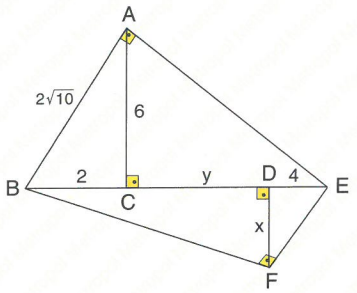
$y = 15$ cm

$y^2 = 9 \cdot x$ [ Euclid]

$15^2 = 9x \Rightarrow x = 25$ cm

**Yanıt / Answer C**

**7.**




$\Rightarrow |AB|^2 = |AC|^2 + |BC|^2$ [Pythagor]

$|BC| = \sqrt{(2\sqrt{10})^2 - 6^2} = 2\,cm$

$(2\sqrt{10})^2 = 2\cdot(y+6)$ [Euclid]

$40 = 2y + 12 \Rightarrow y = 14\,cm$

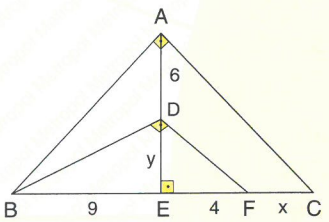
$\perp \widehat{BFE}$

$\Rightarrow x^2 = 16\cdot 4$ [Euclid]

$x = 8$ cm

**Yanıt / Answer E**

**8.**




$y^2 = 9\cdot 4 = 36$ [Euclid]

$y = 6$ cm

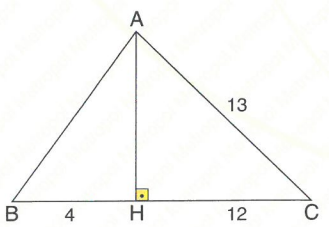
$\perp \widehat{ABC}$

$|AE|^2 = 9\cdot(4 + x)$ [Euclid]

$12^2 = 36 + 9x \Rightarrow x = 12$ cm

**Yanıt / Answer B**

**9.**



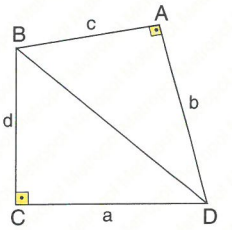

$|AC|^2 = |AH|^2 + |HC|^2$ [Pythagor]

$|AH| = 5$ cm

$|AB| = \sqrt{4^2 + 5^2} = \sqrt{41}$ cm

**Yanıt / Answer D**

**10.**



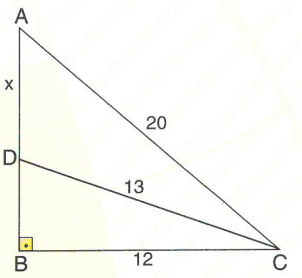

$|BD|^2 = a^2 + d^2$ [Pythagor]
$|BD|^2 = b^2 + c^2$ [Pythagor] $\Rightarrow$

$2\cdot|BD|^2 = a^2 + b^2 + c^2 + d^2$

$2\cdot|BD|^2 = 128 \Rightarrow |BD|^2 = 64 \Rightarrow |BD| = 8$ cm

**Yanıt / Answer B**

**11.**




$|BD|^2 = 13^2 - 12^2 = 25$ [Pythagor]

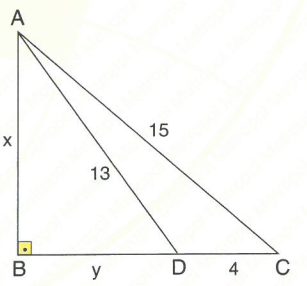
$|BD| = 5$ cm

$(x + 5)^2 + 12^2 = 20^2$ [Pythagor]

$x + 5 = 16 \Rightarrow x = 11$ cm

**Yanıt / Answer C**

**12.**




$x^2 + y^2 = 13^2$ [Pythagor]

$x^2 + (y + 4)^2 = 15^2$ [Pythagor]

$x^2 + y^2 + 8y + 16 = 15^2$

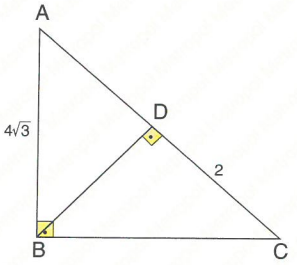
$8y = 40 \Rightarrow y = 5$ cm

$x^2 + 5^2 = 13^2$ [Pythagor]

$x = 12$ cm

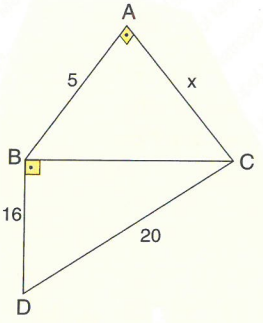
**Yanıt / Answer E**

**1.** $[AB] \perp [BC]$,
$[BD] \perp [AC]$,
$|AB| = 4\sqrt{3}$ cm,
$|DC| = 2$ cm
$\Rightarrow$ **$|AC| = ?$ cm**



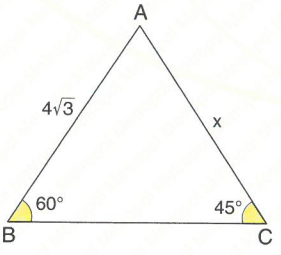

A) 4 B) 5 C) 6 D) 7 E) 8

**2.** $[AB] \perp [AC]$,
$|AB| = 5$ cm,
$|BD| = 16$ cm,
$|DC| = 20$ cm
$\Rightarrow$ **$|AC| = x = ?$ cm**




A) 109 B) $\sqrt{111}$ C) $\sqrt{119}$ D) 13 E) 12

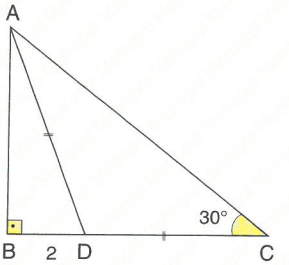
**3.** $m(\widehat{ABC}) = 60°$,
$m(\widehat{BCA}) = 45°$,
$|AB| = 4\sqrt{3}$ cm
$\Rightarrow$ **$|AC| = ?$ cm**




B C

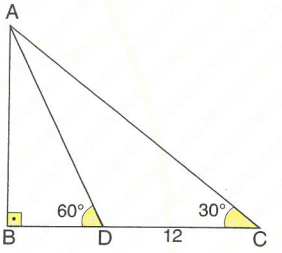
A) 3 B) $3\sqrt{2}$ C) $4\sqrt{2}$ D) 6 E) $6\sqrt{2}$

**4.** $[AB] \perp [BC]$,
$|AD| = |DC|$,
$|BD| = 2$ cm,
$m(\widehat{ACB}) = 30°$
$\Rightarrow$ **$|AC| = ?$ cm**



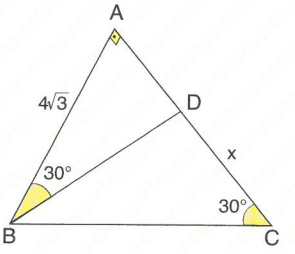

A) $4\sqrt{3}$ B) $4\sqrt{2}$ C) $6\sqrt{2}$ D) $\frac{4\sqrt{3}}{3}$ E) $\frac{8\sqrt{3}}{3}$

**5.** $[AB] \perp [AC]$,
$m(\widehat{BDA}) = 60°$,
$m(\widehat{BCA}) = 30°$,
$|DC| = 12$ cm
$\Rightarrow$ **$|AB| = ?$ cm**



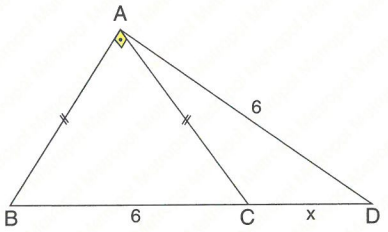

A) $4\sqrt{3}$ B) $\sqrt{2}$ C) $6\sqrt{3}$ D) 9 E) 12

**6.** $[BA] \perp [AC]$,
$m(\widehat{ABD}) = 30°$,
$m(\widehat{BCD}) = 30°$,
$|AB| = 4\sqrt{3}$ cm
$\Rightarrow$ **$|DC| = x = ?$ cm**




A) 14 B) 12 C) 10 D) 8 E) 6

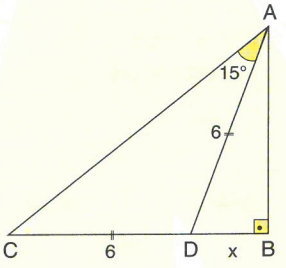
**7.**




[BA] ⊥ [CA], IBCI = IADI = 6 cm,
IABI = IACI ⇒ **ICDI = x = ? cm**

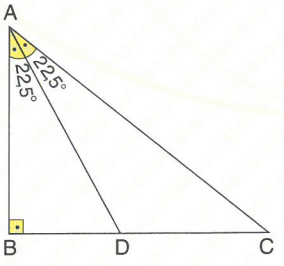
A) $\sqrt{3}$ B) $3(\sqrt{3}-1)$ C) $3\sqrt{3}-1$
D) $2\sqrt{3}-1$ E) $2(\sqrt{3}+1)$

**8.** [AB] ⊥ [BC],
ICDI = IADI = 6 cm,
$m(\widehat{CAD}) = 15°$
⇒ **IDBI = x = ? cm**



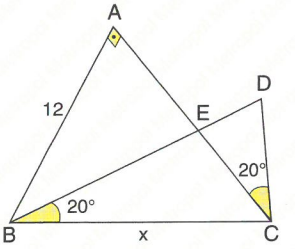

A) $2\sqrt{5}$ B) $2\sqrt{6}$ C) 5
D) $3\sqrt{3}$ E) $2\sqrt{7}$

**9.** [AB] ⊥ [BC],
$m(\widehat{BAD}) = m(\widehat{CAD}) = 22{,}5°$
⇒ $\frac{\textbf{IADI}}{\textbf{IBCI}}$ **= ?**



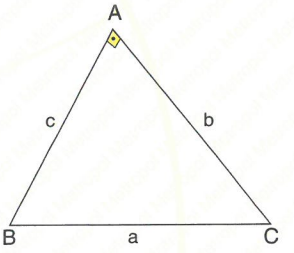

A) $\sqrt{2-\sqrt{2}}$ B) $\sqrt{8-4\sqrt{2}}$ C) $\sqrt{2+\sqrt{2}}$
D) $\sqrt{4-2\sqrt{2}}$ E) $\sqrt{4+2\sqrt{2}}$

**10.** $m(\widehat{BAC}) = 90°$,
$m(\widehat{DBC}) = m(\widehat{ACD}) = 20°$,
IBCI = IBDI,
IABI = 12 cm
⇒ **IBCI = ? cm**



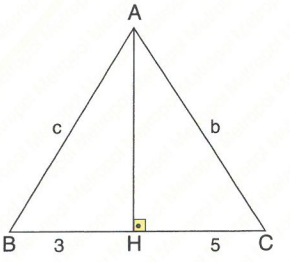

A) $4\sqrt{10}$ B) $5\sqrt{7}$ C) $6\sqrt{5}$
D) $8\sqrt{3}$ E) $14\sqrt{2}$

**11.** [BA] ⊥ [AC],
b – c = 3 cm,
b·c = 8 cm
⇒ **a = ? cm**




A) $\frac{15}{2}$ B) $\frac{13}{2}$ C) 4 D) 5 E) 6

**12.** [AH] ⊥ [BC],
IBHI = 3 cm,
IHCI = 5 cm,
IABI = c cm,
IACI = b cm,
b – c = 2 cm
⇒ **b + c = ? cm**

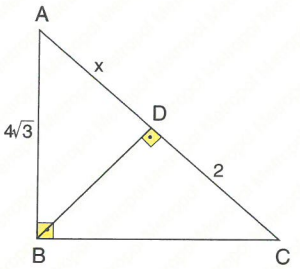



A) 4 B) 6 C) 7 D) 8 E) 9

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | C | E | A | C | D | B | D | D | D | D | D |

1.




$(4\sqrt{3})^2 = x\cdot(x+2)$ [Euclid]

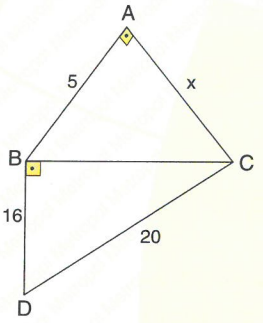
$48 = x^2 + 2x \Rightarrow x^2 + 2x - 48 = 0$

$(x-6)\cdot(x+8) = 0 \Rightarrow x = 6$ cm

$|AC| = 8$ cm

Yanıt / Answer E

2.




$|DC|^2 = |CB|^2 + |DB|^2$ [Pythagor]

$|BC| = \sqrt{20^2 - 16^2} = 12$ cm

$\perp \widehat{ABC}$

$|BC|^2 = |AB|^2 + |AC|^2$ [Pythagor]

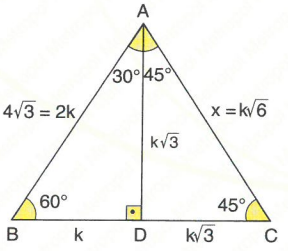
$12^2 = 5^2 + x^2 \Rightarrow x^2 = \sqrt{119}$ cm

$x = \sqrt{119}$ cm

Yanıt / Answer C

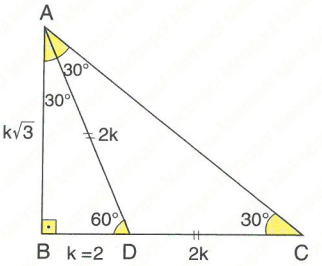
3. $2k = 4\sqrt{3} \Rightarrow k = 2\sqrt{3}$

$x = (2\sqrt{3})\cdot(\sqrt{6}) = 6\sqrt{2}$ cm




Yanıt / Answer E

4.



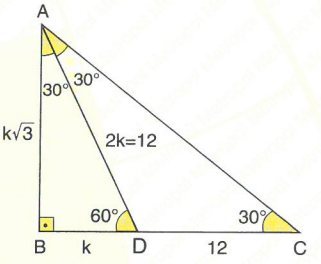

$k = 2$ cm $\Rightarrow |AD| = 2k = 4$ cm, $|AB| = 2\sqrt{3}$ cm

$|AC| = \sqrt{(2\sqrt{3})^2 + 6^2}$ [Pythagor]

$|AC| = 4\sqrt{3}$ cm

Yanıt / Answer A

5.



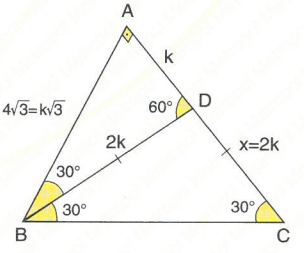

$2k = 12$ cm $\Rightarrow k = 6$ cm

$\perp \widehat{ABC}$ (30°, 60°, 90°)

$|AB| = k\sqrt{3} \Rightarrow 6\sqrt{3}$ cm

Yanıt / Answer C

6.

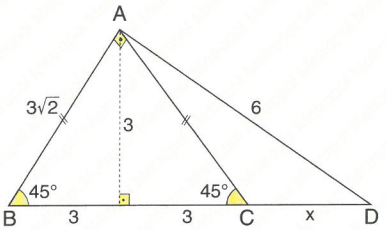



$k\sqrt{3} = 4\sqrt{3} \Rightarrow k = 4$ cm

$x = 2k = 8$ cm

Yanıt / Answer D

**7.**




$|AB| = |AC| = \frac{\sqrt{2}}{2} \cdot 6 = 3\sqrt{2}$ cm

$3^2 + (3+x)^2 = 6^2$ (pythagor)

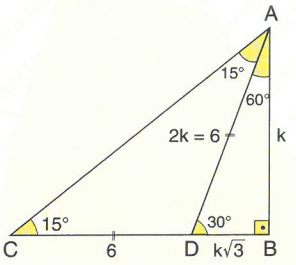
$(3+x)^2 = 27$

$3 + x = 3\sqrt{3} \Rightarrow x = 3\sqrt{3} - 3$

**Yanıt / Answer B**

**8.** $2k = 6 \Rightarrow k = 3$ cm

$x = k\sqrt{3} = 3\sqrt{3}$ cm




**Yanıt / Answer D**

**9.** $|AB| = |BC| = 1$ cm

$|AC| = \sqrt{2}$ cm

$m(\widehat{BAD}) = m(\widehat{CAD})$

$\frac{|AB|}{|AC|} = \frac{|BD|}{|DC|}$

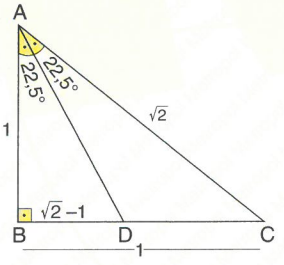
$\frac{1}{\sqrt{2}} = \frac{|BD|}{1-|BD|}$

$|BD| = \sqrt{2} - 1$cm

$|AD|^2 = 1^2 + (\sqrt{2}-1)^2$ [Pythagor]

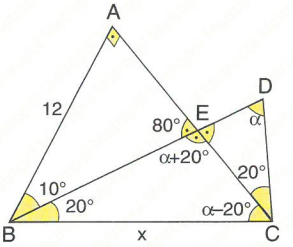
$|AD| = \sqrt{4 - 2\sqrt{2}}$ cm

$\frac{|AD|}{|BC|} = \frac{\sqrt{4-2\sqrt{2}}}{1} = \sqrt{4-2\sqrt{2}}$




**Yanıt / Answer D**

**10.**



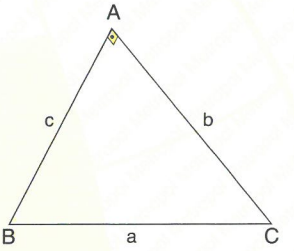

$2\alpha + 20° = 180° \Rightarrow \alpha = 80°$

$\Rightarrow |AB| = k\sqrt{3} = 12 \Rightarrow k = 4\sqrt{3}$

$x = 2k = 8\sqrt{3}$ cm

**Yanıt / Answer D**

**11.**




$b - c = 3 \Rightarrow (b-c)^2 = 3^2$

$b^2 + c^2 - 2bc = 9 \Rightarrow b^2 + c^2 = 25$

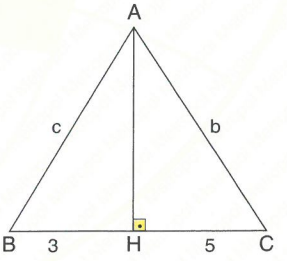
$b \cdot c = 8$

$a^2 = b^2 + c^2 = 25$ [Pythagor]

$a = 5$ cm

**Yanıt / Answer D**

**12.**




$|AH|^2 = b^2 - 5^2 = c^2 - 3^2$ [Pythagor]

$b^2 - c^2 = 5^2 - 3^2$

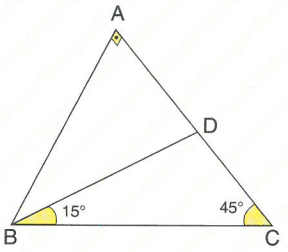
$b - c = 2$ cm

$(b-c) \cdot (b+c) = 16 \Rightarrow b + c = 8$ cm

**Yanıt / Answer D**

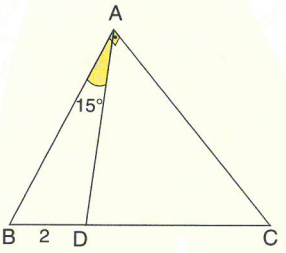
**1.** $[BA] \perp [AC]$,

$m(\widehat{DBC}) = 15°$,
$m(\widehat{DCB}) = 45°$,
$|DC| = 2$ cm
$\Rightarrow$ **$|AD| = ?$ cm**



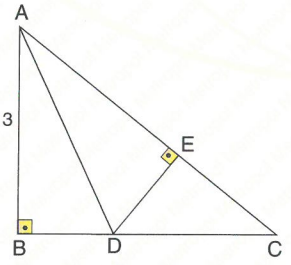

A) $\sqrt{3} + 3$ B) $\sqrt{2} + 2$ C) $\sqrt{3} + 1$ D) $\sqrt{3} - 1$ E) $\sqrt{3} - 2$

**2.** $[BA] \perp [AC]$,
$|AB| = |AC|$,
$m(\widehat{BAD}) = 15°$,
$|BD| = 2$ cm
$\Rightarrow$ **$|AC| = ?$ cm**



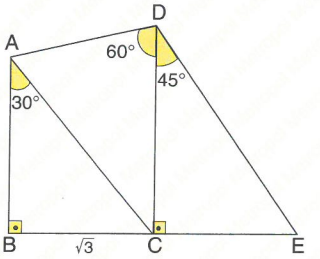

A) $\sqrt{2}(3 + \sqrt{3})$ B) $3 + \sqrt{3}$ C) $2(3 + \sqrt{3})$ D) $2\sqrt{3}$ E) 6

**3.** $[AB] \perp [BC]$,
$[DE] \perp [AC]$,
$|BD| = |AB| = 3$ cm,
$|BC| = 4$ cm
$\Rightarrow$ **$|DE| = ?$ cm**



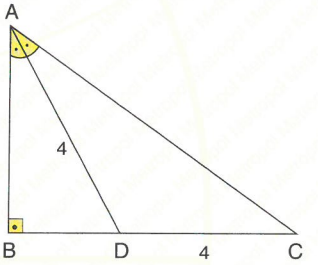

A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{4}{5}$ E) 1

**4.** $[AB] \perp [BC]$,
$[DC] \perp [CE]$,
$m(\widehat{BAC}) = 30°$,
$m(\widehat{CDE}) = 45°$,
$m(\widehat{ADC}) = 60°$,
$|BC| = \sqrt{3}$ cm
$\Rightarrow$ **$|DE| = ?$ cm**



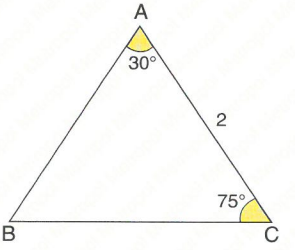

A) $2\sqrt{3}$ B) $2\sqrt{6}$ C) $4\sqrt{2}$ D) $4\sqrt{6}$ E) $8\sqrt{3}$

**5.** $[AB] \perp [BD]$,
$m(\widehat{BAD}) = m(\widehat{CAD})$,
$|AD| = |CD| = 4$ cm,
$\Rightarrow$ **$|BC| = ?$ cm**



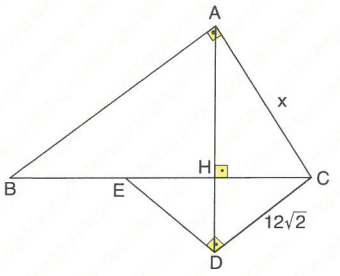

A) 4 B) 6 C) 8 D) 9 E) 10

**6.** $m(\widehat{BAC}) = 30°$,
$m(\widehat{BCA}) = 75°$,
$|AC| = 2$ cm
$\Rightarrow$ **$|BC|^2 = ?$ cm**



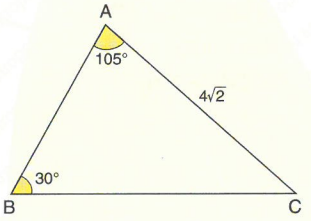

A) $\sqrt{3}$ B) $2\sqrt{3}$ C) $2 - \sqrt{3}$ D) $8 - 4\sqrt{3}$ E) $4 - \sqrt{3}$

**7.** $m(\widehat{BAC}) = 90°$,
$m(\widehat{EDC}) = 90°$,
$|BE| = |CE|$,
$|DC| = 12\sqrt{2}$ cm
$\Rightarrow$ **$|AC| = x = ?$ cm**



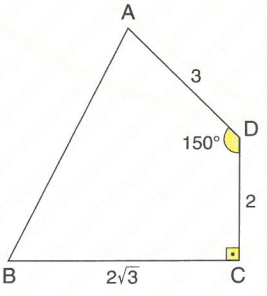

A) 3 B) 6 C) 12 D) 18 E) 24

**8.** $m(\widehat{BAC}) = 105°$,
$m(\widehat{ABC}) = 30°$,
$|AC| = 4\sqrt{2}$ cm
$\Rightarrow$ **$|BC| = ?$ cm**



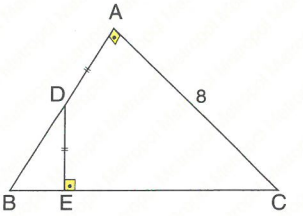

A) $2\sqrt{3}$ B) $\sqrt{2} + 1$ C) $4\sqrt{3} - 2$
D) $4\sqrt{3} + 4$ E) $4\sqrt{3} - 3$

**9.** $[DC] \perp [BC]$,
$m(\widehat{ADC}) = 150°$,
$|AD| = 3$ cm,
$|DC| = 2$ cm,
$|BC| = 2\sqrt{3}$ cm
$\Rightarrow$ **$|AB| = ?$ cm**



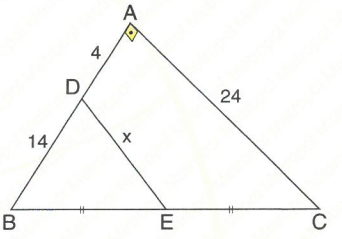

A) 4 B) 5 C) 6 D) 7 E) 8

**10.** $[BA] \perp [AC]$,
$[DE] \perp [BC]$,
$|DE| = |AD|$,
$|AC| = 8$ cm,
$|BC| = 24$ cm
$\Rightarrow$ **$|DE| = ?$ cm**



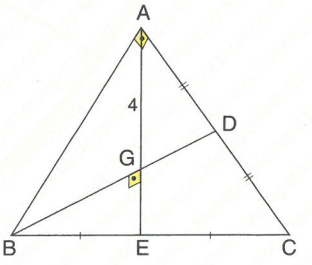

A) 2 B) $2\sqrt{2}$ C) 4 D) $4\sqrt{2}$ E) 8

**11.** $[BA] \perp [AC]$,
$|BE| = |EC|$,
$|AC| = 24$ cm,
$|BD| = 14$ cm,
$|DA| = 4$ cm
$\Rightarrow$ **$|DE| = x = ?$ cm**




A) 11 B) 13 C) 15 D) 17 E) 19

**12.** $[BA] \perp [AC]$,
$[BG] \perp [GE]$,
$|BE| = |EC|$,
$|AD| = |DC|$,
$|AG| = 4$ cm
$\Rightarrow$ **$|AC| = ?$ cm**




A) $7\sqrt{2}$ B) $2\sqrt{3}$ C) $2\sqrt{6}$
D) $4\sqrt{2}$ E) $4\sqrt{6}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | A | C | C | B | D | E | D | B | D | B | E |

**1.** $|AB| = |AC| \Rightarrow$

$\sqrt{3}x = x + 2 \Rightarrow$

$(\sqrt{3} - 1)x = 2$

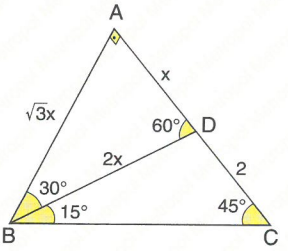
$\sqrt{3}x = x + 2 \Rightarrow$

$(\sqrt{3} - 1)x = 2$

$x = \dfrac{2}{\sqrt{3} - 1}$

$= \dfrac{2(\sqrt{3} + 1)}{3 - 1}$

$|AD| = \sqrt{3} + 1$ cm




**Yanıt / Answer C**

**2.** $t + 2 = \sqrt{3}t$

$2 = (\sqrt{3} - 1)t$

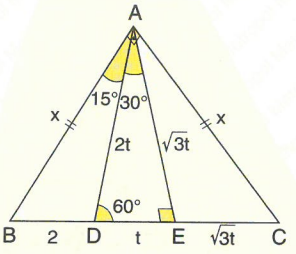
$t = \dfrac{2}{\sqrt{3} - 1}$

$(\sqrt{3} + 1)$

$= \dfrac{2(\sqrt{3} + 1)}{3 - 1}$

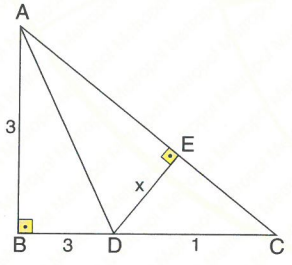
$t = \sqrt{3} + 1$ ve (and) $x = \sqrt{2} \cdot \sqrt{3}t$

$x = \sqrt{6}t = \sqrt{6} \cdot (\sqrt{3} + 1) = \sqrt{2} \cdot (3 + \sqrt{3})$ cm




**Yanıt / Answer A**

**3.**

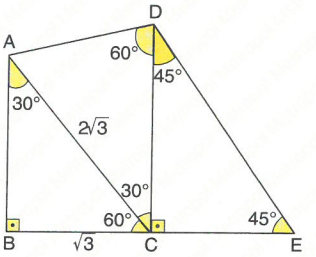



$|AC| = 5$ cm

$\left.\begin{array}{l} A(\widehat{ADC}) = \dfrac{5x}{2} \\ A(\widehat{ADC}) = \dfrac{3 \cdot 1}{2} \end{array}\right\} \Rightarrow 5x = 3 \Rightarrow x = \dfrac{3}{5}$ cm

**Yanıt / Answer C**

**4.**



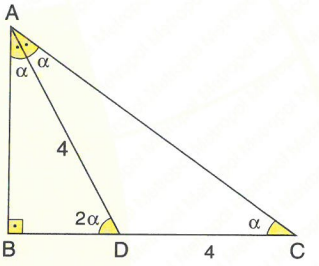

$\left.\begin{array}{l} \perp \widehat{ABC}\ (30°, 60°, 90°) \\ \perp \widehat{ACD}\ (30°, 60°, 90°) \\ \perp \widehat{DCE}\ (45°, 45°, 90°) \end{array}\right\} \Rightarrow$

$|AC| = 2\sqrt{3}$ cm $\Rightarrow |DC| = \dfrac{2}{\sqrt{3}} \cdot 2\sqrt{3} = 4$ cm

$|DE| = 4\sqrt{2}$ cm

**Yanıt / Answer C**

**5.**

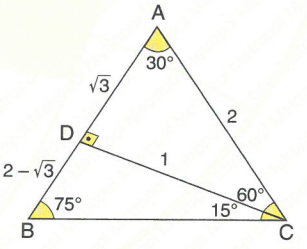



$3\alpha = 90° \Rightarrow \alpha = 30°$

$|AD| = |CD| = 4$ cm, $|BD| = 2$ cm $\Rightarrow |BC| = 6$ cm

**Yanıt / Answer B**

**6.**




$|AC| = 2$ cm $\Rightarrow |AD| = \sqrt{3}$ cm

$|DB| = 2 - \sqrt{3}$ cm

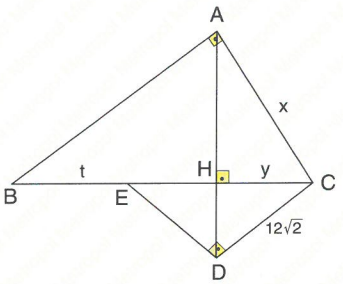
$|BC|^2 = 1^2 + (2 - \sqrt{3})^2$ [Pythagor]

$|BC|^2 = 1 + (4 - 4\sqrt{3} + 3)$

$|BC|^2 = 8 - 4\sqrt{3}$ cm

**Yanıt / Answer D**

**7.**




$|BE| = t,\ |BC| = 2t$

$(12\sqrt{2})^2 = y\cdot t$ [Euclid ]

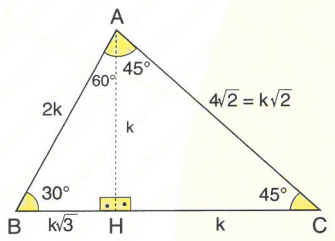
$y\cdot t = 12^2\cdot 2$

$x^2 = y\cdot(2t)$ [Euclid ]

$x^2 = 12^2\cdot 2^2 \Rightarrow x = 24$ cm

**Yanıt / Answer E**

**8.**

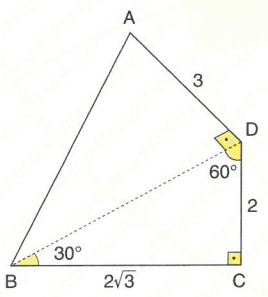



$k\sqrt{2} = 4\sqrt{2} \Rightarrow k = 4$ cm

$|BC| = k + k\sqrt{3} \Rightarrow |BC| = 4 + 4\sqrt{3}$ cm

**Yanıt / Answer D**

**9.**

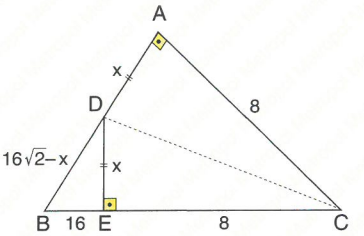



$|BC| = 2\sqrt{3} = \sqrt{3}\,|DC| \Rightarrow m(\widehat{DBC}) = 30°,\ m(\widehat{CDB}) = 60°$

$|BD| = 4$ cm $\Rightarrow |AB| = 5$ cm [Pythagor ]

**Yanıt / Answer B**

**10.**




$|AB|^2 = \sqrt{24^2 - 8^2}$ [Pythagor]

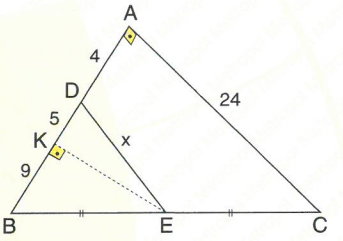
$= \sqrt{512} = 16\sqrt{2}$ cm

$x^2 + 16^2 = (16\sqrt{2} - x)^2$ [Pythagor]

$x^2 + 16^2 = 2\cdot 16^2 + x^2 - 32\sqrt{2x} \Rightarrow x = 4\sqrt{2}$ cm

**Yanıt / Answer D**

**11.**




$\widehat{BKE} \sim \widehat{BAC} \Rightarrow \dfrac{|BE|}{|BC|} = \dfrac{|KE|}{|AC|}$

$|KE| = \dfrac{|AC|}{2} = \dfrac{24}{2} = 12$ cm

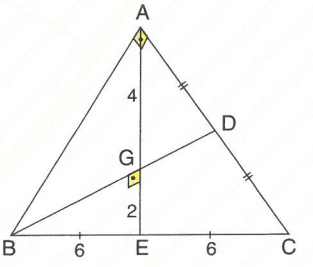
$x^2 = 5^2 + 12^2$ [Pythagor ]

$x = 13$ cm

**Yanıt / Answer B**

**12.** G noktası ağırlık merkezidir.

The point G is center of the gravity.




$|GE| = 2$ cm,

$|AE| = |BE| = |EC| = 6$ cm

$|BG| = \sqrt{6^2 - 2^2}$

$= \sqrt{32} = 4\sqrt{2}$ cm

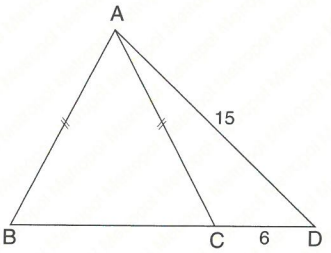
$|GD| = 2\sqrt{2}$ cm

$|AD| = \sqrt{4^2 + (2\sqrt{2})^2} = \sqrt{24} = 2\sqrt{6}$ cm

$|AC| = 2\cdot 2\sqrt{6} = 4\sqrt{6}$ cm

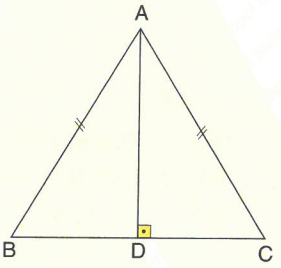
**Yanıt / Answer E**

1. IABI = IACI,
IADI = 15 cm,
ICDI = 6 cm,
IBCI = 12 cm
⇒ **IACI = ? cm**



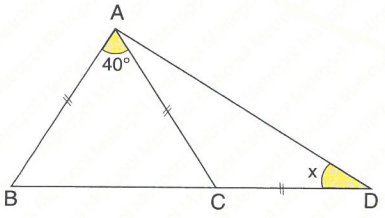

A) 10 B) $3\sqrt{13}$ C) 11 D) $3\sqrt{14}$ E) 12

2. IABI = IACI,
IBCI = 18 cm,
Cevre perimeter $(\widehat{ABC})$ = 48 cm
⇒ **IADI = ? cm**




A) 10 B) 11 C) 12 D) 13 E) 14

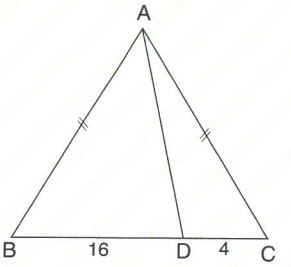
3.




IABI = IACI = ICDI, m$(\widehat{BAC})$ = 40 ⇒ **m$(\widehat{ADC})$ = ?**

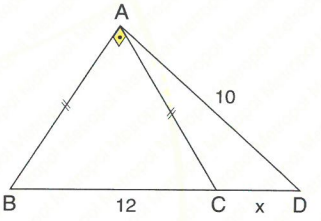
A) 30° B) 35° C) 40° D) 45° E) 50°

4. IABI = IACI = 20 cm,
IDCI = 4 cm,
IBDI = 16 cm
⇒ **IADI = ? cm**



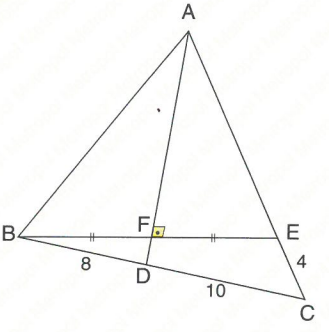

A) $4\sqrt{21}$ B) $4\sqrt{22}$ C) $4\sqrt{23}$ D) $8\sqrt{7}$ E) $8\sqrt{21}$

5. [AB] ⊥ [CA],
IABI = ICAI,
IADI = 10 cm,
IBCI = 12 cm
⇒ **ICDI = x = ? cm**



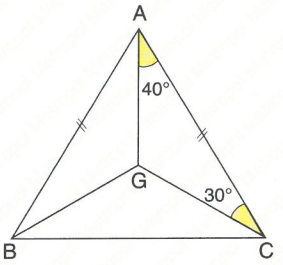

A) 1 B) 2 C) 3 D) 4 E) 6

6. [AF] ⊥ [BE],
IBFI = IFEI,
IBDI = 8 cm,
IDCI = 10 cm,
IECI = 4 cm
⇒ **IABI = ? cm**



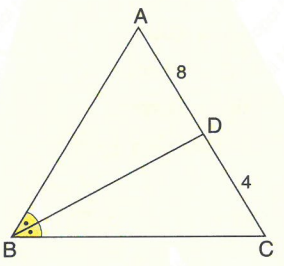

A) 16 B) 14 C) 12 D) 10 E) 8

**7.** G noktası ağırlık merkezidir.
G is center of the gravity.
IABI = IACI,
$m(\widehat{GAC}) = 40°$,
$m(\widehat{GCA}) = 30°$
$\Rightarrow$ **$m(\widehat{AGB})$ = ?**



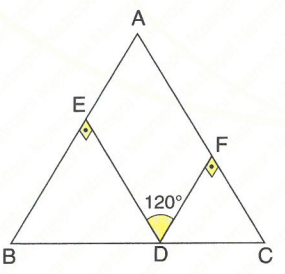

A) 70° B) 80° C) 90° D) 100° E) 110°

**8.** IABI = IACI,
IADI = 8 cm,
IDCI = 4 cm
$\Rightarrow$ **IBDI = ? cm**



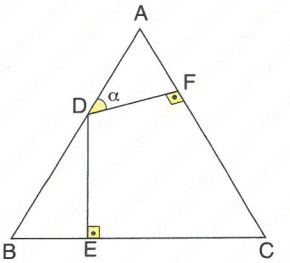

A) 2 B) $2\sqrt{10}$ C) 4
D) $4\sqrt{10}$ E) 6

**9.** [AB] ⊥ [ED],
[DF] ⊥ [AC],
IABI = IACI,
IEDI + IDFI = $9\sqrt{3}$ cm,
$m(\widehat{EDF}) = 120°$
$\Rightarrow$ **IABI = ? cm**



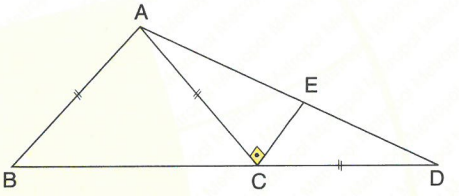

A) 9 B) 12 C) $12\sqrt{3}$
D) 18 E) $18\sqrt{3}$

**10.** [DE] ⊥ [BC],
[DF] ⊥ [AC],
ICAI = ICBI = 14 cm,
IDEI = 4 cm,
IDFI = 3 cm
$\Rightarrow$ **$m(\widehat{ADF}) = \alpha$ = ?**




A) 15° B) 30° C) 45° D) 60° E) 75°

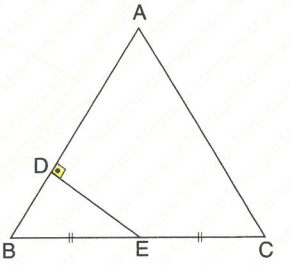
**11.**




[AC] ⊥ [CE], IABI = IACI = ICDI,
$m(\widehat{EDC}) = 30°$, IABI = $4\sqrt{3}$ cm $\Rightarrow$ **IAEI = ? cm**

A) 7 B) 8 C) 9 D) 10 E) 11

**12.** [ED] ⊥ [AB],
IABI = IACI,
IBDI = 2 cm,
IADI = 8 cm
$\Rightarrow$ **IECI = ? cm**

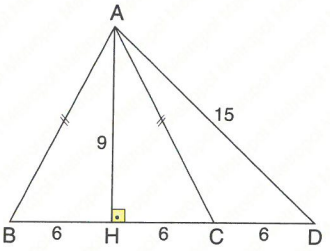



A) $2\sqrt{5}$ B) 5 C) 6
D) $3\sqrt{5}$ E) 7

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | C | B | A | B | A | E | B | D | A | B | A |

**1.**




$|AB| = |AC|$, $|AH| \perp [BC] \Rightarrow |BH| = |HC|$

$|AH| = \sqrt{15^2 - 12^2}$ [Pythagor]

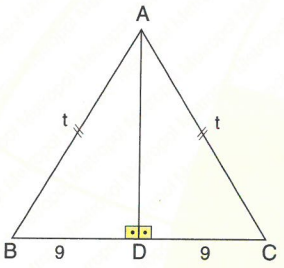
$|AH| = 9$ cm

$|AC| = \sqrt{9^2 + 6^2}$ [Pythagor]

$= 3\sqrt{13}$ cm

**Yanıt / Answer B**

**2.**




$|AB| = |AC| \Rightarrow |BD| = |DC|$

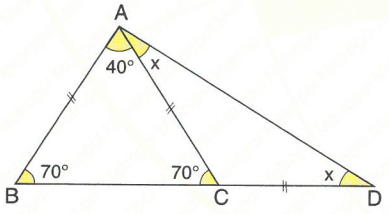
$Ç(\widehat{ABC}) = 2t + 18 \Rightarrow 48 = 2t + 18 \Rightarrow t = 15$ cm

$|AD|^2 = 15^2 - 9^2$ [Pythagor]

$|AD| = 12$ cm

**Yanıt / Answer C**

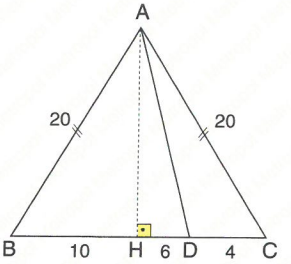
**3.**




$x = \frac{70°}{2} = 35°$

**Yanıt / Answer B**

**4.**



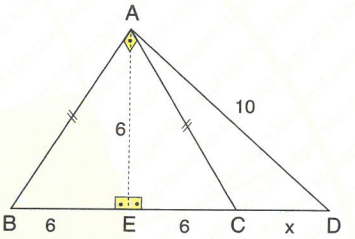

$|AB| = |AC| \Rightarrow |BH| = |HC|$

$|AH| = \sqrt{20^2 - 10^2} = 10\sqrt{3}$ cm[Pythagor]

$|AD| = \sqrt{(10\sqrt{3})^2 + 6^2} = \sqrt{336} = 4\sqrt{21}$ cm

**Yanıt / Answer A**

**5.**




$\Rightarrow |AE| = |BE| = |EC| = 6$ cm

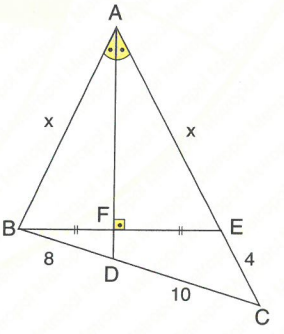
$6^2 + (6 + x)^2 = 10^2$ [Pythagor]

$x^2 + 12x - 28 = 0 \Rightarrow (x + 14)\cdot(x - 2) = 0$

$\Rightarrow x = 2$ cm

**Yanıt / Answer B**

**6.**




$[AF] \perp [BE]$ ,

$|BF| = |FE| \Rightarrow m(\widehat{BAF}) = m(\widehat{FAE})$

$\frac{x}{x+4} = \frac{8}{10}$ [Açıortay teoremi / Bisecor theorem]

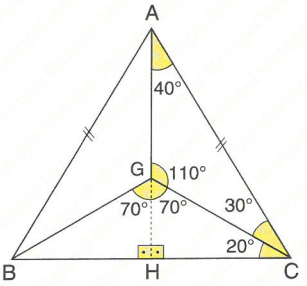
$10x = 8x + 32$

$2x = 32$

$x = 16$

**Yanıt / Answer A**

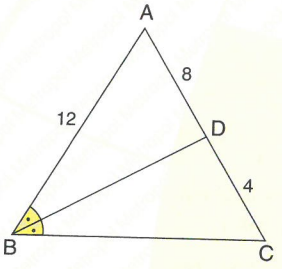
**7.**




$m(\widehat{AGB}) = 360° - (110° + 70° + 70°) = 110°$

**Yanıt / Answer E**

**8.**




$\frac{|AB|}{|AD|} = \frac{|BC|}{|CD|}$ [açıortay teoremi]

[the angle bisec tor tehorem ]

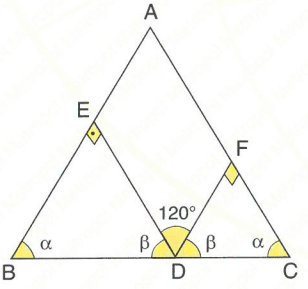
$\frac{12}{8} = \frac{|BC|}{4} \Rightarrow |BC| = 6$ cm

$|BD|^2 = 12 \cdot 6 - 8 \cdot 4$

$= 72 - 32 = 40 \Rightarrow |BD| = 2\sqrt{10}$ cm

**Yanıt / Answer B**

**9.**




$|DE| + |DF| = 9\sqrt{3}$ cm

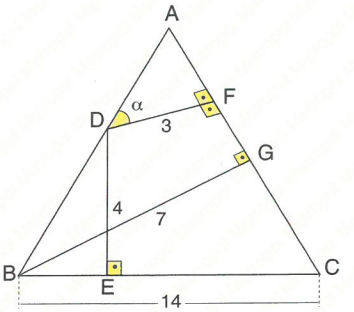
$2\beta = 60° \Rightarrow \beta = 30° \Rightarrow \alpha = 60°$

$\Rightarrow \widehat{A} = 60° \Rightarrow \widehat{ABC}$ (60°, 60°, 60°)

$h = \frac{\sqrt{3}}{2}a \Rightarrow 9\sqrt{3} = \frac{\sqrt{3}}{2}a \Rightarrow a = 18$ cm

**Yanıt / Answer D**

**10.**




$h = |BG| = |DE| + |DF| = 4 + 3 = 7$ cm

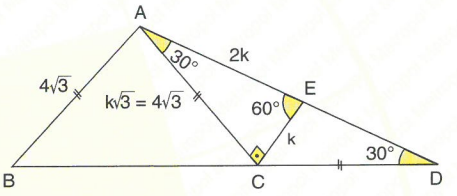
$2|BG| = |BC|$

$m(\widehat{C}) = 30°$

$|AC| = |BC| \Rightarrow m(\widehat{A}) = 75°$ , $\alpha = 15°$

**Yanıt / Answer A**

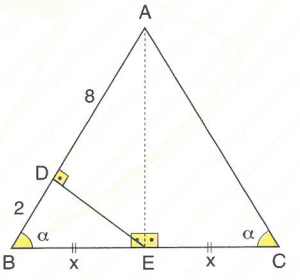
**11.**




$\Rightarrow k\sqrt{3} = 4\sqrt{3} \Rightarrow |AE| = 2k = 8$ cm

**Yanıt / Answer B**

**12.**

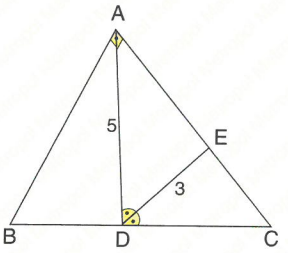



$\Rightarrow x^2 = 2 \cdot 10 = 20$ [ Euclid ]

$x = 2\sqrt{5}$ cm

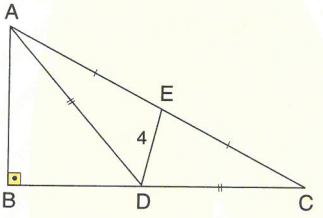
**Yanıt / Answer A**

**1.** [BA] ⊥ [AC],
IBDI = IDCI,
$m(\widehat{ADE}) = m(\widehat{EDC})$,
IADI = 5 cm,
IDEI = 3 cm
⇒ **IECI = ? cm**



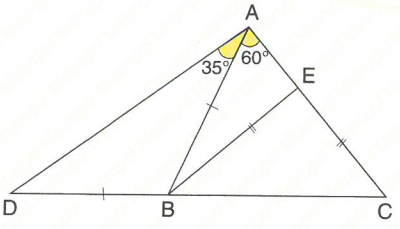

A) $\sqrt{2}$ B) $\sqrt{3}$ C) 2 D) 4 E) $2\sqrt{2}$

**2.** IADI = IDCI,
IAEI = IECI,
IEDI = IBDI = 4 cm
⇒ **IACI = ? cm**



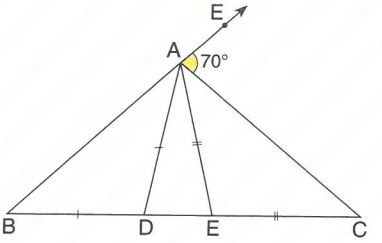

A) 4 B) 6 C) $4\sqrt{3}$ D) 8 E) $8\sqrt{3}$

**3.** IDBI = IBAI
IEBI = IECI
$m(\widehat{DAB}) = 35°$,
$m(\widehat{BAE}) = 60°$
⇒ **$m(\widehat{AEB})$ = ?**



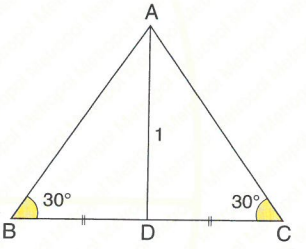

A) 85° B) 90° C) 100° D) 105° E) 120°

**4.** $m(\widehat{EAC}) = 70°$,
IBDI = IADI,
IAEI = IECI
⇒ **$m(\widehat{DAE})$ = ?**



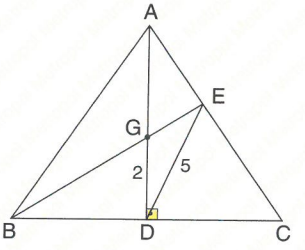

A) 25° B) 35° C) 40° D) 50° E) 55°

**5.** $m(\widehat{ABC}) = m(\widehat{ACD}) = 30°$,
IBDI = IDCI,
IADI = 1 cm
⇒ **IABI = ? cm**



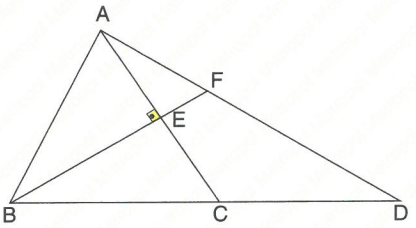

A) 1 B) $\sqrt{2}$ C) $\sqrt{3}$ D) 2 E) 3

**6.** G noktası ağırlık merkezidir.
The point G is center of the gravity.
IGDI = 2 cm,
IDEI = 5 cm
⇒ **IBCI = ? cm**




A) 6 B) 8 C) 12 D) 14 E) 16

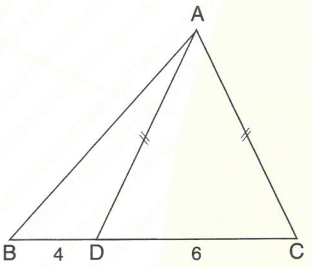
**7.**




IABI = IBCI, [BE] ⊥ [AC], IBCI = ICDI,
IADI = 6 cm ⇒ **IAFI = ? cm**

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) 2 E) 3

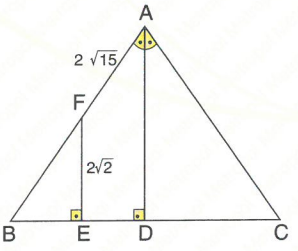
**8.**




IABI = IBCI, IADI = IACI, IBDI = 4 cm,
IDCI = 6 cm ⇒ **Çevre / perimeter $(\widehat{ABC})$ = ? cm**

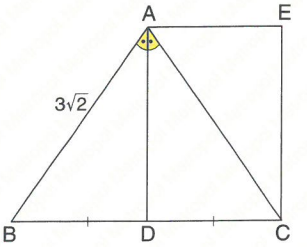
A) $2(\sqrt{5} + 10)$ B) $2(\sqrt{15} + 10)$
C) $2(5\sqrt{5} + 10)$ D) $4(\sqrt{5} + 10)$
E) $4(\sqrt{15} + 10)$

**9.** IABI = IACI = $3\sqrt{15}$ cm,
IEFI = $2\sqrt{2}$ cm
IAFI = $2\sqrt{15}$ cm,
$m(\widehat{BAD}) = m(\widehat{DAC})$,
⇒ **IBEI = ? cm**



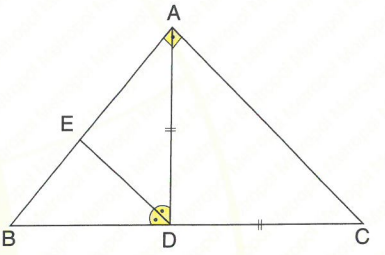

A) $\sqrt{5}$ B) $3\sqrt{7}$ C) $\sqrt{15}$
D) $2\sqrt{15}$ E) $\sqrt{7}$

**10.** IADI // IECI,
$m(\widehat{BAD}) = m(\widehat{DAC})$,
IBDI = IDCI,
IABI = $3\sqrt{2}$ cm,
IAEI = 4 cm
⇒ **IECI = ? cm**



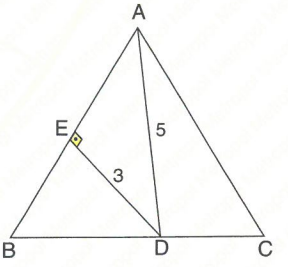

A) $\sqrt{2}$ B) 2 C) 3
D) $2\sqrt{2}$ E) $3\sqrt{3}$

**11.** [AB] ⊥ [AC],
$m(\widehat{ADE}) = m(\widehat{EDB})$,
IADI = IDCI,
IACI = 10 cm,
IABI = 24 cm
⇒ **IDEI = ? cm**




A) 5 B) 6 C) 10 D) 12 E) 13

**12.** [DE] ⊥ [AB],
IABI = IBCI,
IAEI = EBI,
IADI = 5 cm,
IEDI = 3 cm
⇒ **IDCI = ? cm**

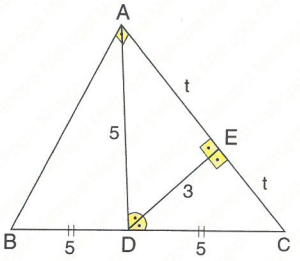



A) 1 B) 2 C) 3 D) 4 E) 5

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E | C | C | D | E | D | B | E | A | A | C |

**1.**




$|AD| = |BD| = |DC| = 5$ cm

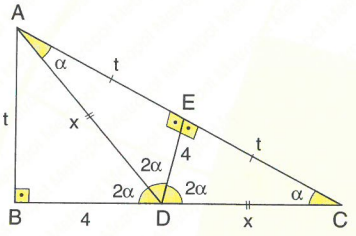
$|DE| \perp |AC|$

$\Rightarrow t^2 + 9 = 25$ [Pythagor]

$t^2 = 16 \Rightarrow t = 4$ cm

**Yanıt / Answer D**

**2.**




$\widehat{ABD} \sim \widehat{AED} \Rightarrow$

benzerlik oranı 1 dir. / the similarity ratio is 1.

$6\alpha = 180° \Rightarrow \alpha = 30°$

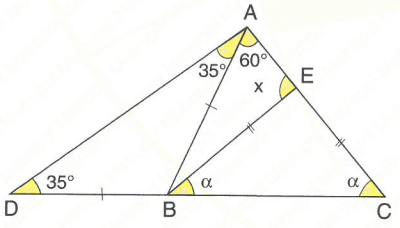
$\perp \widehat{ABD}$ (30°, 60°, 90°)

$\Rightarrow |BD| = 4$ cm $\Rightarrow x = 8$ cm,

$t = 4\sqrt{3} \Rightarrow |AC| = 8\sqrt{3}$ cm

**Yanıt / Answer E**

**3.**

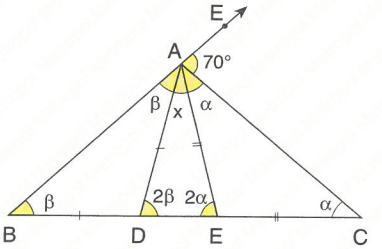



$35° + 35° + 60° + \alpha = 180° \Rightarrow \alpha = 50°$

$x = 2\alpha \Rightarrow x = 100°$

**Yanıt / Answer C**

**4.**

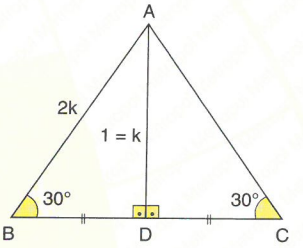



$\alpha + \beta = 70° \Rightarrow 2\alpha + 2\beta = 140°$

$x = 180° - 2(\alpha + \beta) = 40°$

**Yanıt / Answer C**

**5.**

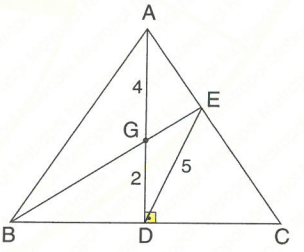



$\Rightarrow |AB| = |AC|$ ve $|AD| \perp [BC]$

$|AD| = k = 1 \Rightarrow |AB| = 2k = 2$ cm

**Yanıt / Answer D**

**6.**




$\widehat{EGD} \sim \widehat{BGA}$

$\frac{|GD|}{|GA|} = \frac{|ED|}{|AB|} \Rightarrow \frac{1}{2} = \frac{5}{|AB|}$

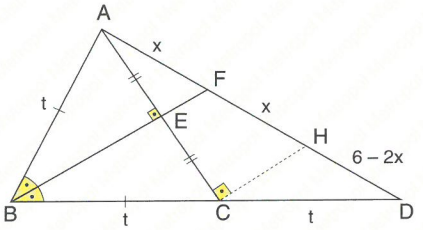
$|AB| = 2 \cdot 5 = 10$ cm

$|BD| = \sqrt{10^2 - 6^2} = 8$ [Pythagor]

$|BC| = 2 \cdot 8 = 16$ cm

**Yanıt / Answer E**

**7.**




$$\left.\begin{array}{l} |HC| \,//\, |BF| \\ \widehat{AEF} \sim \widehat{ACH} \end{array}\right\} \Rightarrow \frac{|AE|}{|AF|} = \frac{|AC|}{|AH|}$$

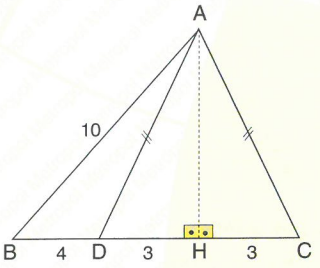
$|AF| = x \Rightarrow |AH| = 2x,\ |HD| = 6 - 2x$

$\widehat{HCD} \sim \widehat{FBD} \Rightarrow \frac{|DC|}{|DB|} = \frac{6-2x}{6-x}$

$\frac{1}{2} = \frac{6-2x}{6-x} \Rightarrow 6 - x = 12 - 4x \Rightarrow 3x = 6 \Rightarrow x = 2$ cm

**Yanıt / Answer D**

**8.**




$|AH|^2 = |AB|^2 - |BH|^2$ [Pythagor]

$|AH| = \sqrt{10^2 - 7^2} = \sqrt{3 \cdot 17} = \sqrt{51}$ cm

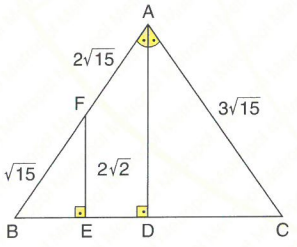
$|AC| = \sqrt{51 + 9} = \sqrt{60}$ cm

$Ç(\widehat{ABC}) = 10 + 10 + \sqrt{60}$

$= 20 + 2\sqrt{15} = 2(\sqrt{15} + 10)$ cm

**Yanıt / Answer B**

**9.**

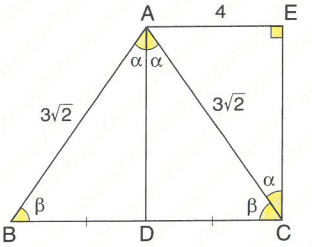



$|BE| = \sqrt{(\sqrt{15})^2 - (2\sqrt{2})^2}$

$|BE| = \sqrt{7}$ cm

**Yanıt / Answer E**

**10.**




$2\alpha + 2\beta = 180° \Rightarrow \alpha + \beta = 90°$

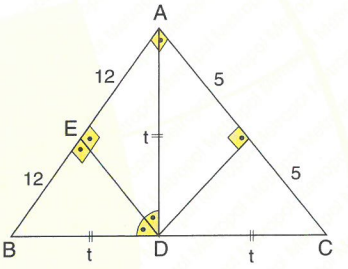
$|AB| = |AC| = 3\sqrt{2}$ cm

$(3\sqrt{2})^2 = 4^2 + |EC|^2$ [Pythagor]

$18 = 16 + |EC|^2 \Rightarrow |EC| = \sqrt{2}$ cm

**Yanıt / Answer A**

**11.**




$|BC|^2 = |AB|^2 + |AC|^2$ [Pythagor]

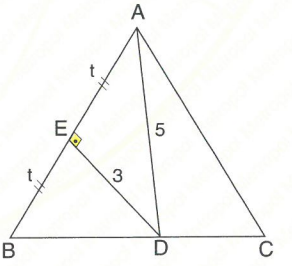
$|BC|^2 = 576 + 100 \Rightarrow |BC| = 26$ cm $\Rightarrow |BD| = 13$ cm

$|BD|^2 = |EB|^2 + |ED|^2$ [Pythagor]

$169 = 144 + |ED|^2 \Rightarrow |ED| = 5$ cm

**Yanıt / Answer A**

**12.**

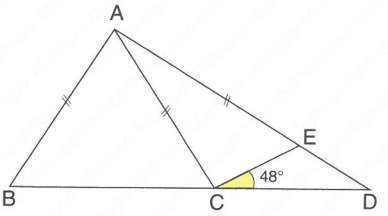



$t = 4 \Rightarrow |BC| = 2t = 8$ cm

$|BD| = 5$ cm $\Rightarrow |DC| = 3$ cm

**Yanıt / Answer C**

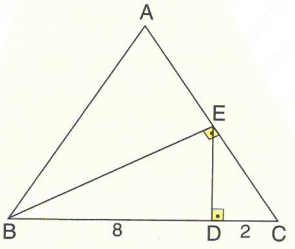
**1.**




IABI = IACI = IAEI, m($\widehat{ECD}$) = 48° ⇒ **m($\widehat{BAD}$) = ?**

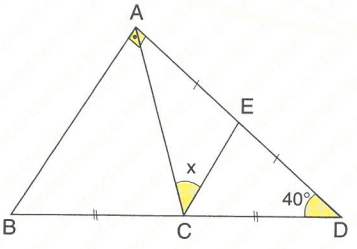
A) 88° B) 92° C) 96° D) 100° E) 104°

**2.** [BE] ⊥ [AC],
[ED] ⊥ [BC],
IABI = IACI,
IBDI = 8 cm
IDCI = 2 cm
⇒ **IABI = ? cm**



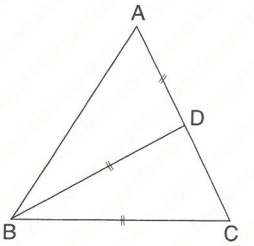

A) $\sqrt{5}$ B) 5 C) $5\sqrt{5}$ D) $5\sqrt{10}$ E) $10\sqrt{5}$

**3.** [BA] ⊥ [DA],
IBCI = ICDI,
IAEI = IEDI,
m($\widehat{EDC}$) = 40°
⇒ **m($\widehat{ACE}$) = ?**



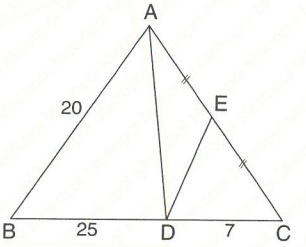

A) 90° B) 80° C) 70° D) 60° E) 50°

**4.** IADI = IBDI = IBCI,
IABI = IACI
⇒ **m($\widehat{BAD}$) = ?**



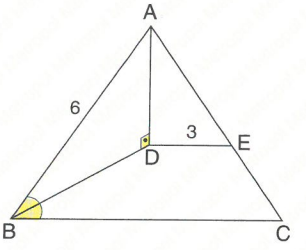

A) 18° B) 36° C) 54° D) 72° E) 90°

**5.** IABI = IACI,
IAEI = IECI,
IABI = 20 cm,
IBDI = 25 cm,
IDCI = 7 cm
⇒ **IDEI = ? cm**



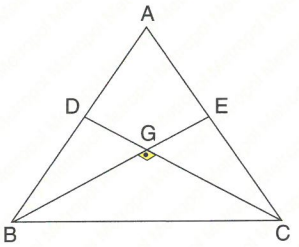

A) $\sqrt{29}$ B) $\sqrt{31}$ C) $\sqrt{37}$ D) $\sqrt{41}$ E) $\sqrt{43}$

**6.** [BD] bir açıortaydır.
[BD] is a bisector.
[DE] // [BC],
IDEI = 3 cm,
IABI = 6 cm
⇒ **IBCI = ? cm**



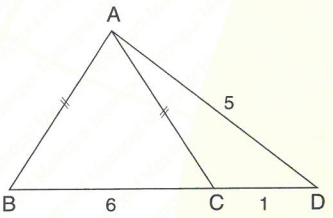

A) 8 B) 10 C) 12 D) 14 E) 16

**7.** G noktası ağırlık merkezidir.
The point G is center of the gravity.
IABI = IACI,
IGEI = 6 cm
⇒ **IABI = ? cm**




A) $6\sqrt{5}$ B) $9\sqrt{5}$ C) 12 D) $12\sqrt{5}$ E) 18

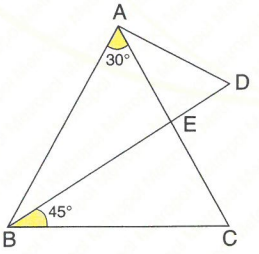
**8.**




IABI = IACI, IBCI = 6 cm, ICDI = 1 cm, IADI = 5 cm
⇒ **IACI = ? cm**

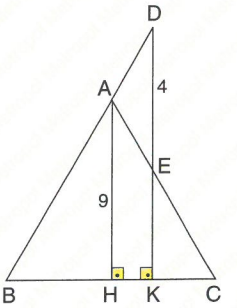
A) $\sqrt{2}$ B) $\sqrt{3}$ C) $3\sqrt{2}$ D) $3\sqrt{3}$ E) $\sqrt{6}$

**9.** IABI = IACI = IBDI,
$m(\widehat{BAC}) = 30°$,
$m(\widehat{EBC}) = 45°$
⇒ **$m(\widehat{BEA})$ = ?**



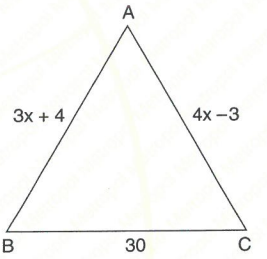

A) 100° B) 110° C) 120° D) 130° E) 140°

**10.** IABI = IACI,
[AH] ⊥ [BC],
[DK] ⊥ [BC],
IAHI = 9 cm,
IDEI = 4 cm
⇒ **IEKI = ? cm**



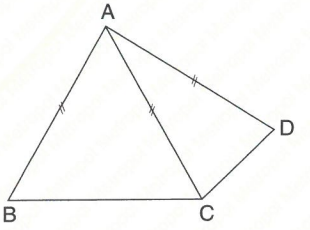

A) 5 B) 7 C) 9 D) 11 E) 14

**11.** IABI = IACI,
IABI = (3x + 4) cm,
IACI = (4x – 3) cm,
IBCI = 30 cm
⇒ **$A(\widehat{ABC})$ = ? $cm^2$**




A) 150 B) 200 C) 250 D) 300 E) 350

**12.** IABI = IACI = IADI,
$m(\widehat{BAD}) = 100°$
⇒ **$m(\widehat{DCB})$ = ?**

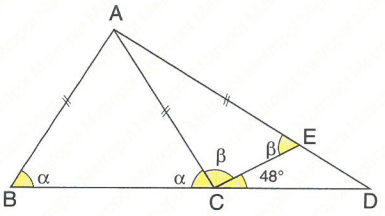



A) 110° B) 120° C) 130° D) 140° E) 150°

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | C | E | B | C | C | D | C | C | B | D | C |

1.

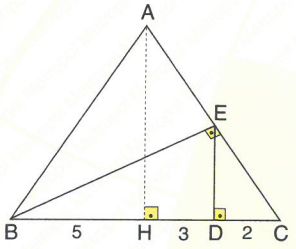



$\alpha + \beta + 48° = 180° \Rightarrow \alpha + \beta = 132°$

$m(\widehat{BAD}) = 2\cdot 180° - (2\alpha + 2\beta) = 96°$

Yanıt / Answer C

2.




$\Rightarrow |ED|^2 = 8\cdot 2$ [Euclid]

$|ED| = 4$ cm

$\widehat{EDC} \sim \widehat{AHC} \Rightarrow \frac{|ED|}{|AH|} = \frac{|DC|}{|CH|}$

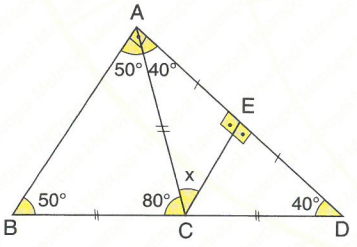
$\frac{4}{|AH|} = \frac{2}{5} \Rightarrow |AH| = 10$ cm

$|AB| = \sqrt{10^2 + 5^2}$ [Pythagor]

$|AB| = \sqrt{125} = 5\sqrt{5}$ cm

Yanıt / Answer C

3.



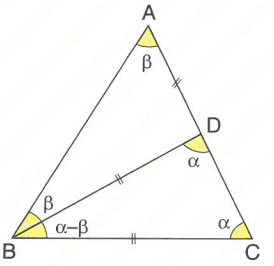

$|AC| = |BC| = |CD| \Rightarrow m(\widehat{CAD}) = 40°$

$|CE| \perp |AD| \Rightarrow x = 180° - (90° + 40°)$

$x = 50°$

Yanıt / Answer E

4.

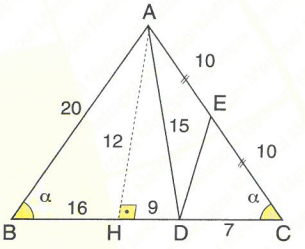



$\alpha = 2\beta$

$5\beta = 180° \Rightarrow \beta = 36°$

Yanıt / Answer B

5.

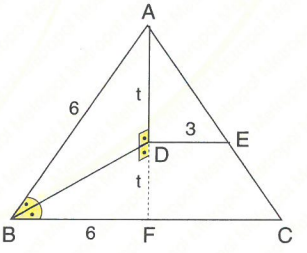



$|DE|^2 = \frac{1}{2}\cdot\left(15^2 + 7^2 - \frac{20^2}{7}\right) = 37$

$|DE| = \sqrt{37}$ cm

Yanıt / Answer C

6.




[BD], ABF üçgeninin açıortayı ve kenarortayıdır.

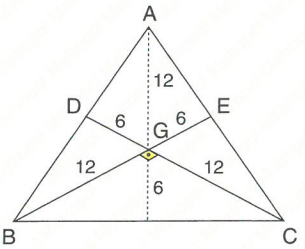
[BD] is a bisector and is a median in the ABF triangle.

$|AB| = 6$ cm $\Rightarrow |BF| = 6$ cm

$DE \,//\, FC \Rightarrow |FC| = 2|DE| = 6 \Rightarrow |BC| = 12$ cm

Yanıt / Answer C

**7.**




$|AD| = |BD| = \sqrt{12^2 + 6^2}$

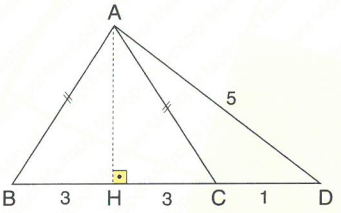
$= 6\sqrt{5}$ cm

$|AB| = 2 \cdot (6\sqrt{5})$

$= 12\sqrt{5}$ cm

**Yanıt / Answer D**

**8.**



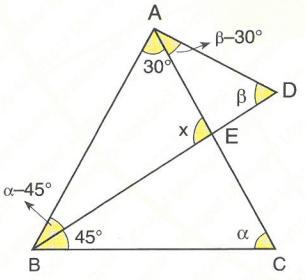

$\left.\begin{array}{l} |AB| = |AC| \\ |AH| \perp |BC| \end{array}\right\} \Rightarrow |BH| = |HC| = 3$ cm

$|AH| = \sqrt{5^2 - 4^2} = 3$ cm [Pythagor]

$|AC|^2 = 3^2 + 3^2 \Rightarrow |AC| = 3\sqrt{2}$ cm

**Yanıt / Answer C**

**9.**



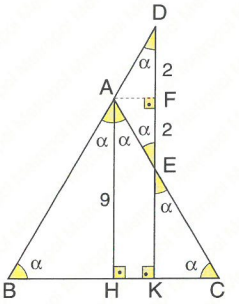

$2\alpha = 180° - 30° = 150° \Rightarrow \alpha = 75°$

$2\beta = 180° - 30° = 150° \Rightarrow \beta = 75°$

$x = 2\beta - 30° \Rightarrow x = 120°$

**Yanıt / Answer C**

**10.**

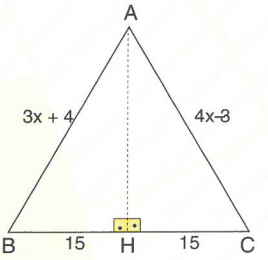



$|DF| = |FE| = 2$ cm

$|EK| = 9 - 2 = 7$ cm

**Yanıt / Answer B**

**11.**

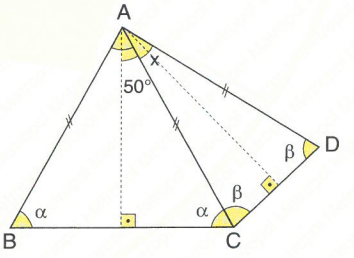



$3x + 4 = 4x - 3 \Rightarrow x = 7 \Rightarrow |AC| = 25$ cm

$|AH| = 20$ cm $\Rightarrow A(\widehat{ABC}) = \dfrac{20 \cdot 30}{2} = 300$ cm$^2$

**Yanıt / Answer D**

**12.**




$m(\widehat{BAD}) = 100°$

$100° + 2\alpha + 2\beta = 360°$

$2\alpha + 2\beta = 260° \Rightarrow \alpha + \beta = 130°$

$m(\widehat{DCB}) = \alpha + \beta = 130°$

**Yanıt / Answer C**

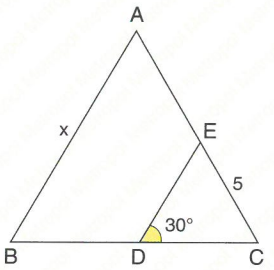
**1.** ABC bir eşkenar üçgendir.

ABC is an equilateral triangle.

$m(\widehat{EDC}) = 30°$,

$|DC| = 2 \cdot |BD|$

$\Rightarrow$ **$|AB|$ = ? cm**




A) 12 B) 14 C) 15 D) 16 E) 20

**2.** ABC bir eşkenar üçgendir.

ABC is an equilateral triangle.

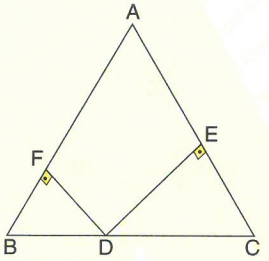
$[DF] \perp [AB]$,

$[DE] \perp [AC]$,

$|DC| = 4 \cdot |DF|$,

$|DE| + |DF| = 10\sqrt{3}$ cm

$\Rightarrow$ **$|AB|$ = ? cm**




A) 18 B) 20 C) 22 D) 24 E) 26

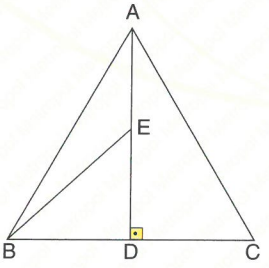
**3.** ABC bir eşkenar üçgendir.

ABC is an equilateral triangle.

$|ED| = 4 \cdot |AE|$,

$|AC| = 10$ cm

$\Rightarrow$ **$|BE|$ = ? cm**




A) $2\sqrt{17}$ B) $\sqrt{70}$ C) $\sqrt{73}$ D) $5\sqrt{3}$ E) $4\sqrt{5}$

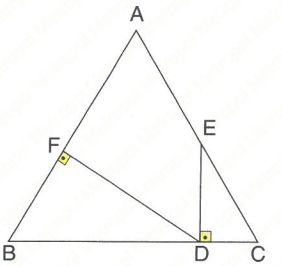
**4.** ABC bir eşkenar üçgendir.

ABC is an equilateral triangle.

$[DF] \perp [AB]$,

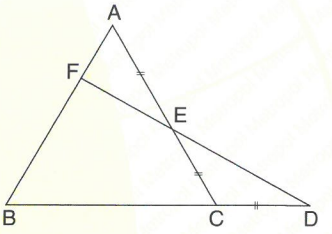
$[ED] \perp [BC]$,

$\Rightarrow \dfrac{|BF|}{|FA|}$ = ?




A) $\frac{2}{9}$ B) $\frac{1}{3}$ C) $\frac{4}{9}$ D) $\frac{5}{9}$ E) $\frac{2}{3}$

**5.**




ABC bir eşkenar üçgendir.

ABC is an equilateral triangle.

$|AE| = |EC| = |CD|$,

$|AF| = 4$ cm $\Rightarrow$ **$|ED|$ = ? cm**

A) 12 B) $5\sqrt{3}$ C) $4\sqrt{10}$ D) $6\sqrt{3}$ E) $8\sqrt{3}$

**6.** ABC bir eşkenar üçgendir.

ABC is an equilateral triangle.

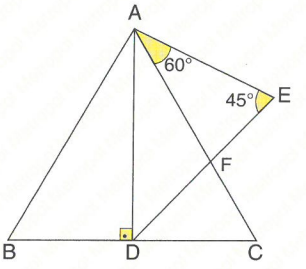
$[AD] \perp [BC]$,

$m(\widehat{EAC}) = 60°$,

$m(\widehat{DEA}) = 45°$,

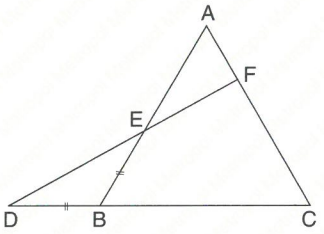
$|AB| = 6$ cm

$\Rightarrow$ **$|DE|$ = ? cm**




A) $3\sqrt{6}$ B) $\sqrt{55}$ C) $2\sqrt{14}$ D) $2\sqrt{15}$ E) 8

**7.**




ABC bir eşkenar üçgendir.

ABC is an equilateral triangle.

IDBI = IBEI, IAEI = IFCI = 6 cm

⇒ **IEBI = ? cm**

A) 1 B) 2 C) 3 D) 4 E) 5

**8.** ABC bir eşkenar üçgendir.

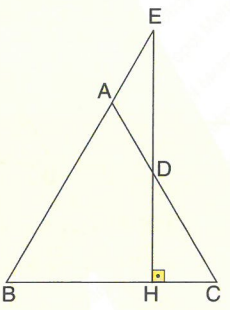
ABC is an equilateral triangle.

[EH] ⊥ [BC],

IABI = 12 cm,

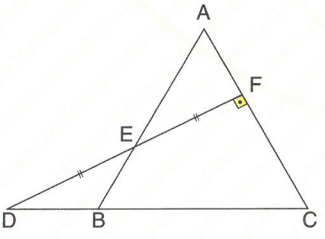
IDCI = 10 cm

⇒ **IEHI = ? cm**




A) $2\sqrt{3}$ B) $5\sqrt{3}$ C) $7\sqrt{3}$ D) 7 E) 14

**9.**




ABC bir eşkenar üçgendir.

ABC is an equilateral triangle.

[DF] ⊥ [AC], IDEI = IEFI = $2\sqrt{3}$ cm ⇒ **IAFI = ? cm**

A) 1 B) 2 C) 3 D) 4 E) 5

**10.** ABC bir eşkenar üçgendir.

ABC is an equilateral triangle.

[PE] // [BC],

[PD] // [AC],

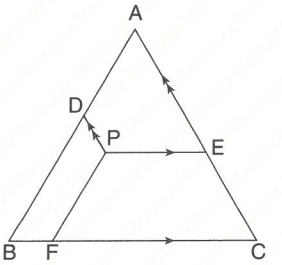
[PF] // [AB],

IPDI = 1 cm,

IPFI = 3 cm,

IPEI = 2 cm

⇒ **IABI = ? cm**




A) $2\sqrt{5}$ B) $2\sqrt{6}$ C) 6 D) $4\sqrt{3}$ E) $2\sqrt{15}$

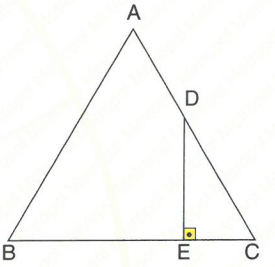
**11.** ABC bir eşkenar üçgendir.

ABC is an equilateral triangle.

[DE] ⊥ [BC]

$\frac{IDCI}{IADI} = \frac{2}{5}$

⇒ $\frac{IEBI}{IECI}$ = ?




A) $\frac{7}{2}$ B) $\frac{8}{3}$ C) 4 D) 5 E) 6

**12.** ABC bir eşkenar üçgendir.

ABC is an equilateral triangle.

[DE] // [BC],

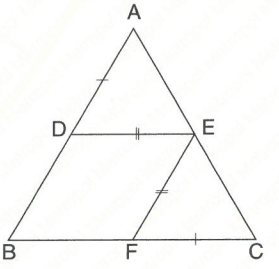
[EF] // [AB],

IDEI = IEFI,

IADI = IFCI

IAEI = 4 cm

⇒ **IABI = ? cm**

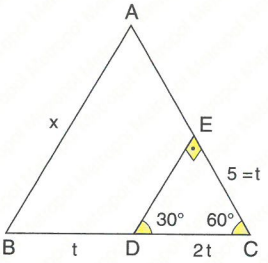



A) 4 B) 6 C) 8 D) 10 E) 12

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | B | C | D | E | A | C | C | B | C | E | C |

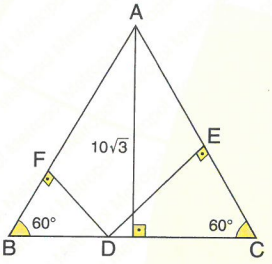
**1.**




$2t = 10 \Rightarrow t = 5$ cm $\Rightarrow x = 3t = 3 \cdot 5 = 15$ cm

**Yanıt / Answer C**

**2.**

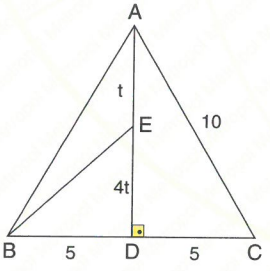



$|DF| + |DE| = 10\sqrt{3} \Rightarrow h = 10\sqrt{3}$ cm

$h = \frac{\sqrt{3}}{2}a \Rightarrow 10\sqrt{3} = \frac{\sqrt{3}}{2}a \Rightarrow a = 20$ cm

**Yanıt / Answer B**

**3.**




$\widehat{ABC}$ (60°, 60°, 60°) $\Rightarrow$

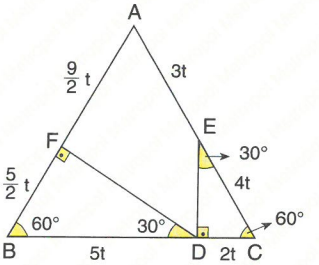
$h = \frac{\sqrt{3}}{2} \cdot |AC| \Rightarrow h = 5\sqrt{3}$ cm $\Rightarrow |ED| = 4\sqrt{3}$ cm

$|BE| = \sqrt{5^2 + (4\sqrt{3})^2}$ [Pythagor]

$= \sqrt{73}$ cm

**Yanıt / Answer C**

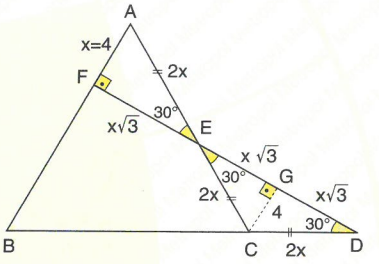
**4.**




$\frac{|BF|}{|FA|} = \frac{\frac{5}{2}t}{\frac{9}{2}t} = \frac{5}{9}$

**Yanıt / Answer D**

**5.**




$\widehat{AFE}$ (30°, 60°, 90°)

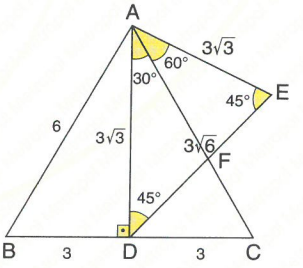
$\widehat{ECG}$ (30°, 60°, 90°) $\Rightarrow$

$\widehat{CGD}$ (30°, 60°, 90°)

$|AF| = x = 4$ cm $\Rightarrow |ED| = 2x\sqrt{3} = 8\sqrt{3}$ cm

**Yanıt / Answer E**

**6.**

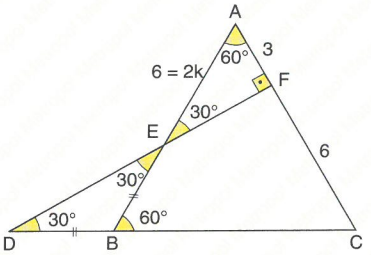



$|AD| = |AE| = 3\sqrt{3}$ cm

$|DE| = 3\sqrt{3} \cdot \sqrt{2} = 3\sqrt{6}$ cm

**Yanıt / Answer A**

**7.**




$|AE| = 2k = 6$ cm

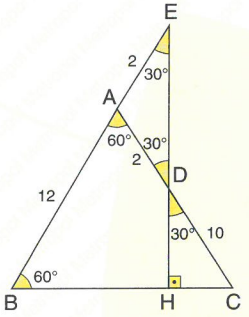
$|AF| = k = 3$ cm

$|AC| = |AB| = |BC|$

$|AB| = 9$ cm $\Rightarrow$ $|EB| = 9 - 6 = 3$ cm

**Yanıt / Answer C**

**8.**

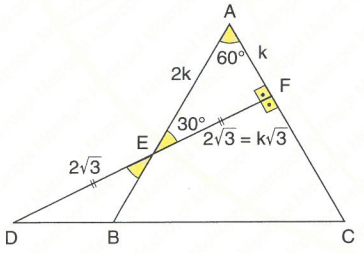



$|AD| = |AE| = 2$ cm

$|EH| = \frac{\sqrt{3}}{2} \cdot 14 = 7\sqrt{3}$ cm

**Yanıt / Answer C**

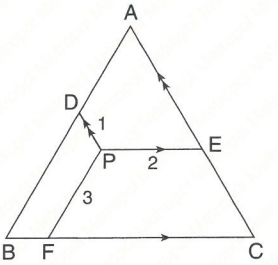
**9.**




$|EF| = k\sqrt{3} = 2\sqrt{3}$ cm $\Rightarrow$ $|AF| = k = 2$ cm

**Yanıt / Answer B**

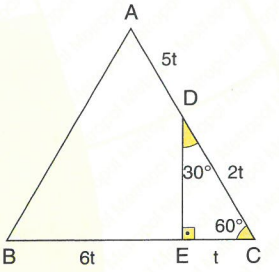
**10.**




$|PE| + |PD| + |PF| = a \Rightarrow a = 6$ cm

**Yanıt / Answer C**

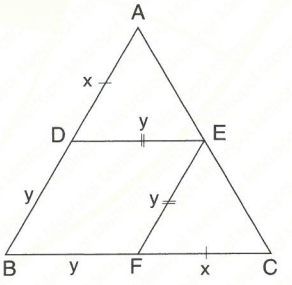
**11.**




$\frac{|EB|}{|EC|} = \frac{6t}{t} = 6$ cm

**Yanıt / Answer E**

**12.**



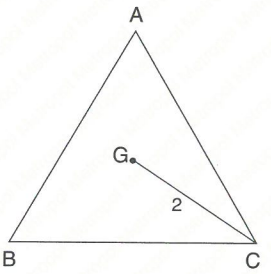

$\widehat{ADE} \sim \widehat{ABC} \Rightarrow$

$\frac{|AD|}{|AB|} = \frac{|DE|}{|BC|} \Rightarrow \frac{x}{x+y} = \frac{y}{x+y} \Rightarrow x = y$

$|AE| = 4$ cm $\Rightarrow |EC| = 4$ cm $\Rightarrow |AB| = 8$ cm

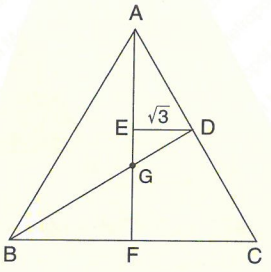
**Yanıt / Answer C**

**1.** ABC bir eşkenar üçgen,
G noktası ağırlık merkezidir.
ABC is an equilateral triangle, G is center of the gravity.
IGCI = 2 cm
⇒ **A($\widehat{ABC}$) = ? cm²**



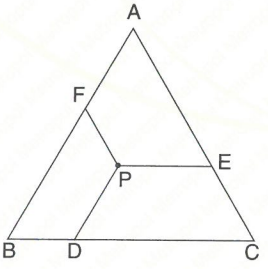

A) 1 B) $\sqrt{3}$ C) 3 D) $3\sqrt{3}$ E) 9

**2.** ABC bir eşkenar üçgendir.
ABC is an equilateral triangle.
IEDI = $\sqrt{3}$ cm
⇒ **IBCI = ? cm**



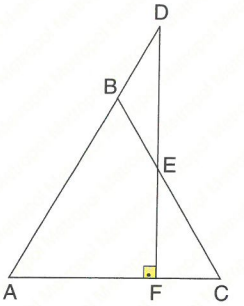

A) $\sqrt{3}$ B) 2 C) $3\sqrt{2}$ D) $3\sqrt{3}$ E) $4\sqrt{3}$

**3.** ABC bir eşkenar üçgendir.
ABC is an equilateral triangle.
IPFI // IACI,
IPEI // IBCI,
IPDI // IABI,
IPFI = $\sqrt{3}$ cm,
IPEI = $3\sqrt{3}$ cm,
IPDI = $2\sqrt{3}$ cm
⇒ **A($\widehat{ABC}$) = ? cm²**



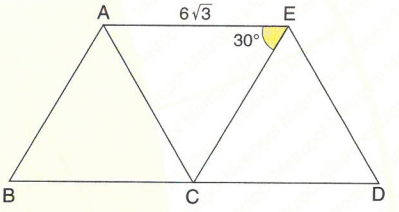

A) $36\sqrt{3}$ B) $27\sqrt{3}$ C) $18\sqrt{3}$ D) 18 E) $9\sqrt{3}$

**4.** ABC bir eşkenar üçgendir.
ABC is an equilateral triangle.
IDEI = IEFI,
IBDI = 2 cm
⇒ **IFCI = ? cm**




A) 2 B) 3 C) 4 D) 5 E) 6

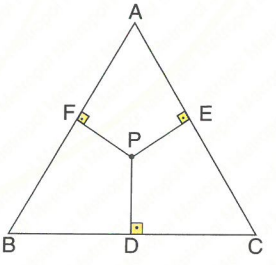
**5.**




ABC ve CED birer eşkenar üçgendir.
ABC and CED are equilateral triangles.
m($\widehat{AEC}$) = 30°, ICDI = 2·IBCI, IAEI = $6\sqrt{3}$
⇒ **IBDI = ? cm**

A) 12 B) 18 C) 30 D) 32 E) 48

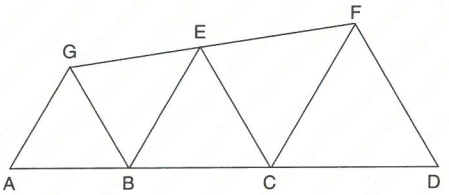
**6.**




ABC bir eşkenar üçgendir.
ABC is an equilateral triangle.
IPFI = 1 cm, IPEI = $\sqrt{3}$ cm, IPDI = 2 cm
⇒ **Çevre / the perimeter ($\widehat{ABC}$) = ? cm**

A) $\sqrt{3} + 2$ B) $\sqrt{3} + 3$ C) $2\sqrt{3} + 4$ D) $6\sqrt{3} + 6$ E) $8\sqrt{3} + 4$

**7.**




ABG, BCE, CDF birer eşkenar üçgendir.

ABG, BCE, CDF are equilateral triangles.

2·|AB| = |BC|, |BD| = 6·|AB|, |AD| = 35 cm

⇒ **|AG| = ? cm**

A) 5 B) $5\sqrt{3}$ C) 10 D) $10\sqrt{3}$ E) 15

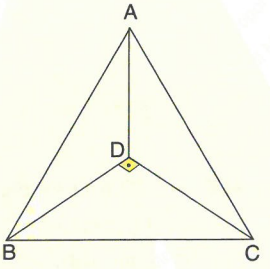
**8.** ABC bir eşkenar üçgendir.

ABC is an equilateral triangle.

[BD] ⊥ [DC],

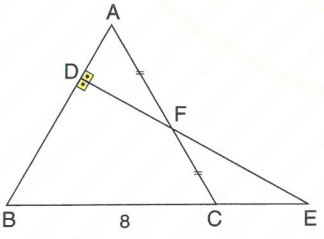
|BD| = |DC| = $\sqrt{6}$ cm

⇒ **|AD| = ? cm**




A) $\sqrt{3}$ B) 3 C) $3 - \sqrt{3}$ D) $3\sqrt{3}$ E) $3 + \sqrt{3}$

**9.**



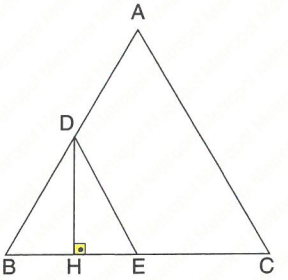

ABC bir eşkenar üçgendir.

ABC is an equilateral triangle.

[ED] ⊥ [AB], |AF| = |FC|, |BC| = 8 cm ⇒ **|CE| = ? cm**

A) 8 B) 6 C) 4 D) 2 E) $2\sqrt{2}$

**10.**




ABC ve BDE birer eşkenar üçgendir.

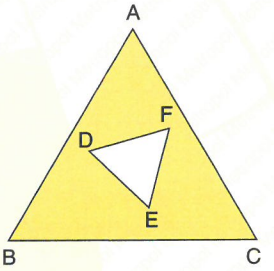
ABC and BDE are equilateral triangles.

[DH] ⊥ [BE], |DH| = $2\sqrt{3}$ cm, |BD| = |DA|

⇒ **Çevre / the perimeter ($\widehat{ABC}$) = ? cm**

A) 6 B) 8 C) 12 D) 16 E) 24

**11.**




ABC ve DEF birer eşkenar üçgendir.

Each of ABC and DEF are equilateral triangles.

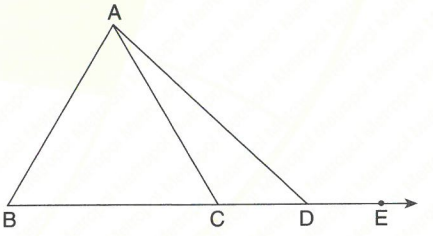
çevre / perimeter(ABC) + çevre / perimeter(DEF) = 60 cm,

taralı alan / the shaded area = $10\sqrt{3}$ cm$^2$

⇒ **|FD| = ? cm**

A) 9 B) 6 C) 4 C) 2 D) $\sqrt{2}$

**12.**




ABC bir eşkenar üçgendir.

ABC is an equilateral triangle.

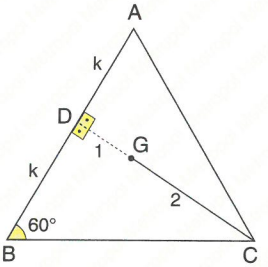
m($\widehat{ACD}$) = 3·m($\widehat{CDA}$) ⇒ **m($\widehat{ADE}$) = ?**

A) 110° B) 120° C) 130° D) 140° E) 160°

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E | B | A | B | D | A | C | C | E | A | D |

**1.**




$\widehat{BDC}$ (30°, 60°, 90°) ⇒

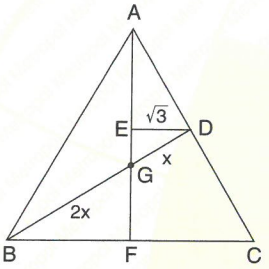
$|DC| = 3 = k\sqrt{3} \Rightarrow k = \sqrt{3}$ cm

$|AB| = 2\sqrt{3}$ cm

$A(\widehat{ABC}) = \frac{\sqrt{3}}{4} \cdot (2\sqrt{3})^2 = 3\sqrt{3}$ cm$^2$

**Yanıt / Answer D**

**2.**




EDG ~ FBG ⇒

$\frac{|GD|}{|BG|} = \frac{|ED|}{|BF|} \Rightarrow \frac{x}{2x} = \frac{\sqrt{3}}{|BF|}$

$|BF| = 2\sqrt{3}$ cm

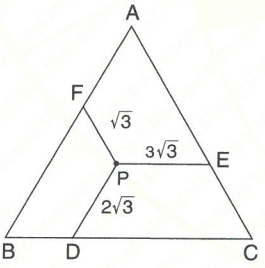
$|BC| = 2|BF| \Rightarrow |BC| = 4\sqrt{3}$ cm

$|BF| = 2\sqrt{3}$ cm

$|BC| = 2|BF| \Rightarrow |BC| = 4\sqrt{3}$ cm

**Yanıt / Answer E**

**3.**



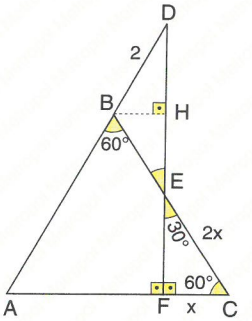

$\widehat{ABC}$ (60°, 60°, 60°) ⇒

$|PF| + |PE| + |PD| = a \Rightarrow a = 6\sqrt{3}$ cm

$A(\widehat{ABC}) = \frac{\sqrt{3}}{4}a^2 = 27\sqrt{3}$ cm$^2$

**Yanıt / Answer B**

**4.**




$\widehat{EFC}$ (30°, 60°, 90°) ⇒

$m(\widehat{D}) = m(\widehat{E}) = 30° \Rightarrow |BD| = |BE| = 2$ cm

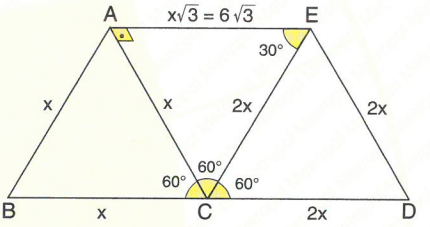
$|BH| = 1$ cm, $|HE| = \sqrt{3}$ cm,

$|DE| = |EF| = 2\sqrt{3}$ cm

$\sqrt{3}x = 2\sqrt{3} \Rightarrow x = 2$ cm

**Yanıt / Answer A**

**5.**

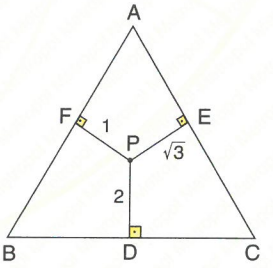



$|AE| = x\sqrt{3} = 6\sqrt{3}$ cm ⇒ $x = 6$ cm

$|BD| = 3x = 18$ cm

**Yanıt / Answer B**

**6.**




$|PE| + |PF| + |PD| = h$

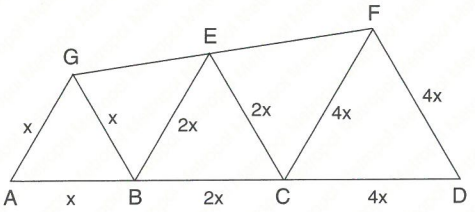
$\sqrt{3} + 1 + 2 = h \Rightarrow h = 3 + \sqrt{3}$ cm

$h = \frac{\sqrt{3}}{2}a \Rightarrow a = \frac{2.(3+\sqrt{3})}{\sqrt{3}}$ cm

$Ç(\widehat{ABC}) = 3a = 2\cdot(3\sqrt{3} + 3) = 6\cdot(\sqrt{3} + 1) = 6\sqrt{3} + 6$ cm

**Yanıt / Answer D**

**7.**



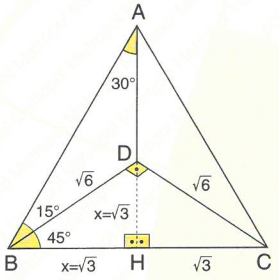

$|AB| = x \Rightarrow |BC| = 2x \Rightarrow |BD| = 6x, \ |CD| = 4x$

$|AD| = 35 \Rightarrow 7x = 35 \Rightarrow x = 5$ cm

$|AG| = 5$ cm

**Yanıt / Answer A**

**8.**




$\left.\begin{array}{l}\widehat{BDC}\ (45°, 45°, 90°)\\ \widehat{ABH}\ (30°, 60°, 90°)\end{array}\right\} \Rightarrow$

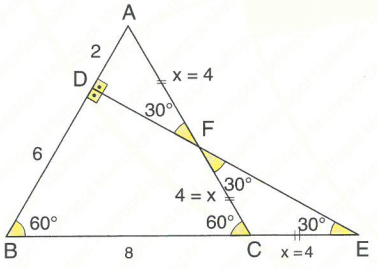
$x\sqrt{2} = \sqrt{6} \Rightarrow x = \sqrt{3}$ cm

$|AH| = x\sqrt{3} = 3$ cm

$|AD| = 3 - \sqrt{3}$ cm

**Yanıt / Answer C**

**9.**



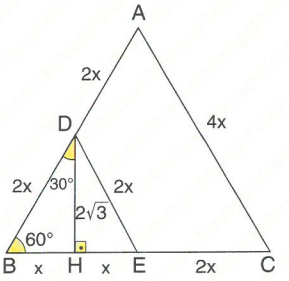

Şekildeki veriler kullanılarak aşağıdaki sonuç bulunur.

By using given the informations in the figure, we obtain following result.

$2x = 8 \Rightarrow x = 4$ cm

**Yanıt / Answer C**

**10.**




$|DH| = x\sqrt{3} = 2\sqrt{3} \Rightarrow x = 2$ cm

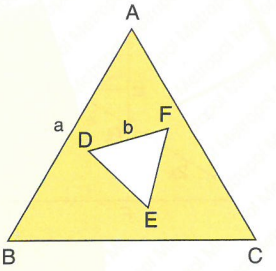
$|DB| = 2x = 4$ cm

$|AB| = |BC| = |AC| = 4x = 8$ cm

$Ç(\widehat{ABC}) = 8 \cdot 3 = 24$ cm

**Yanıt / Answer E**

**11.**




$3a + 3b = 60 \Rightarrow a + b = 20$ cm

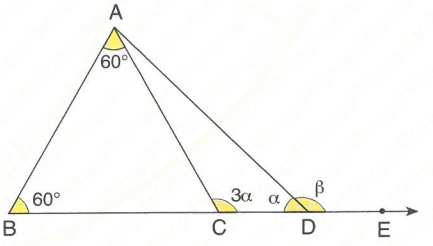
$[TA/SA] = \frac{\sqrt{3}}{4}a^2 - \frac{\sqrt{3}}{4}b^2$

$= 10\sqrt{3} \Rightarrow a^2 - b^2 = 40$

$\left.\begin{array}{l}a - b = 2\\ a + b = 20\end{array}\right\} \Rightarrow b = 9$ cm

**Yanıt / Answer A**

**12.**

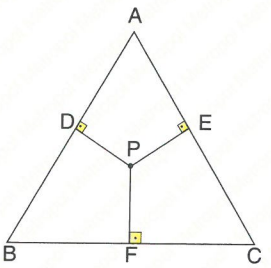



$3\alpha = 120° \Rightarrow \alpha = 40° \Rightarrow \beta = 140°$

**Yanıt / Answer D**

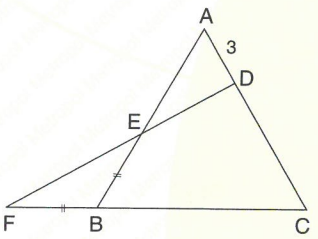
**1.** ABC bir eşkenar üçgendir.
ABC is an equilateral triangle.

$A(\widehat{ABC}) = 4\sqrt{3}$ cm$^2$,
IDPI = $1 - \sqrt{3}$ cm,
IPEI = $2\sqrt{3}$ cm
⇒ **IPFI = ? cm**




A) $\sqrt{3} - 1$ B) $1 - \sqrt{3}$ C) 2 D) $2 + \sqrt{3}$ E) $2\sqrt{3}$

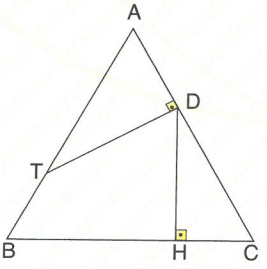
**2.**




ABC bir eşkenar üçgendir.
ABC is an equilateral triangle.
IFBI = IEBI = 3 cm, IADI = 3 cm
⇒ **IBCI = ? cm**

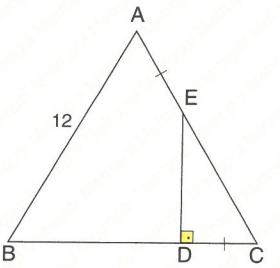
A) 3 B) 6 C) 9 D) 12 E) 15

**3.** ABC bir eşkenar üçgendir.
ABC is an equilateral triangle.
ITBI = 2 cm,
IHCI = 3 cm
⇒ **$A(\widehat{ABC})$ = ? cm$^2$**



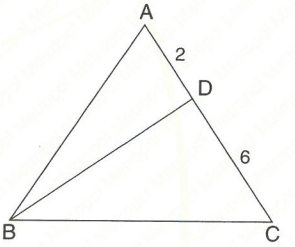

A) $5\sqrt{3}$ B) $10\sqrt{3}$ C) $15\sqrt{3}$ D) $25\sqrt{3}$ E) $30\sqrt{3}$

**4.** ABC bir eşkenar üçgendir.
ABC is an equilateral triangle.
[ED] ⊥ [BC],
IAEI = IDCI,
IABI = 12 cm,
IBDI = 8 cm
⇒ **IEDI = ? cm**



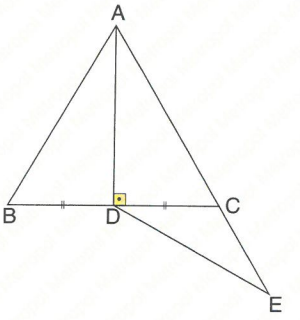

A) 4 B) $4\sqrt{3}$ C) 6 D) $6\sqrt{3}$ E) 8

**5.** ABC bir eşkenar üçgendir.
ABC is an equilateral triangle.
IADI = 2 cm,
IDCI = 6 cm
⇒ **IBDI = ? cm**



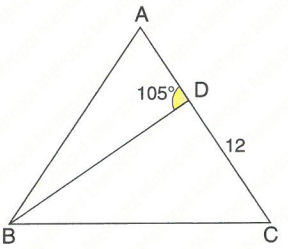

A) 2 B) $2\sqrt{3}$ C) $2\sqrt{7}$ D) $2\sqrt{11}$ E) $2\sqrt{13}$

**6.** ABC bir eşkenar üçgendir.
ABC is an equilateral triangle.
[AD] ⊥ [BC],
IBDI = ICEI,
IABI = 12 cm
⇒ **IDEI = ? cm**



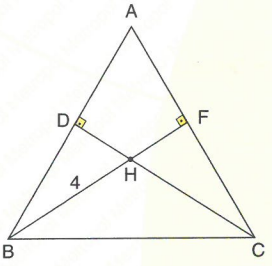

A) $3\sqrt{3}$ B) 6 C) $6\sqrt{3}$ D) 9 E) $9\sqrt{3}$

**7.** ABC bir eşkenar üçgendir.
ABC is an equilateral triangle.
$m(\widehat{BDA}) = 105°$,
$|DC| = 12$ cm
$\Rightarrow$ **$|AB|$ = ? cm**




A) 6 B) $6\sqrt{3}$ C) $6 + 6\sqrt{3}$ D) 12 E) $6\sqrt{3} + 12$

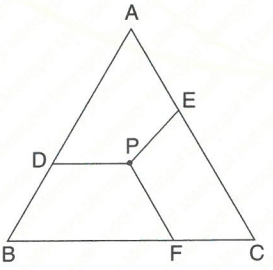
**8.**




$|AD| = |DB|$, $|AF| = |FC|$, $|AC| = |BC|$, $|BH| = 4$ cm
$\Rightarrow$ **çevre / the perimeter $A(\widehat{ABC})$ = ? cm**

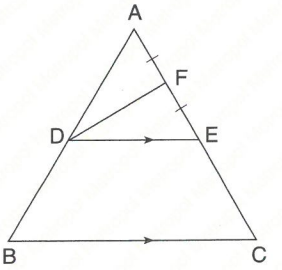
A) $2\sqrt{3}$ B) $4\sqrt{3}$ C) $6\sqrt{3}$ D) $8\sqrt{3}$ E) $12\sqrt{3}$

**9.** ABC bir eşkenar üçgendir.
ABC is an equilateral triangle.
$A(\widehat{ABC}) = 4\sqrt{3}$ cm$^2$,
$|DP| = \sqrt{2}$ cm,
$|PE| = 2 - \sqrt{2}$ cm
$\Rightarrow$ **$|PF|$ = ? cm**



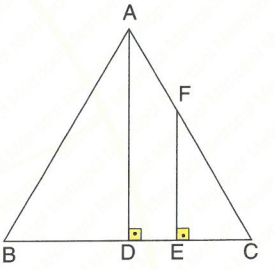

A) 1 B) 2 C) 4 D) $2\sqrt{2}$ E) $2\sqrt{3}$

**10.** ABC bir eşkenar üçgendir.
ABC is an equilateral triangle.
$[DE] \,//\, [BC]$,
$|BC| = 8$ cm,
$|AF| = |FE|$,
$|DF| = 2\sqrt{3}$ cm
$\Rightarrow$ **$|DB|$ = ? cm**



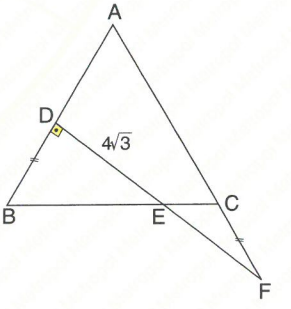

A) 2 B) $2\sqrt{2}$ C) $2\sqrt{3}$ D) 3 E) 4

**11.** ABC bir eşkenar üçgendir.
ABC is an equilateral triangle.
$|DE| = |EC|$,
$|AB| = 8$ cm
$\Rightarrow$ **$|EF|$ = ? cm**




A) 2 B) $\sqrt{3}$ C) $2\sqrt{3}$ D) 5 E) 9

**12.** ABC bir eşkenar üçgendir.
ABC is an equilateral triangle.
$[ED] \perp [AB]$,
$|BD| = |CF|$,
$|BE| = 2 \cdot |EC|$,
$|DE| = 4\sqrt{3}$ cm
$\Rightarrow$ **$|AB|$ = ? cm**

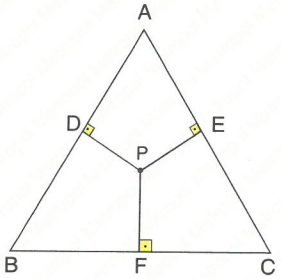



A) 10 B) 11 C) 12 D) 13 E) 14

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | C | D | B | E | C | C | E | B | E | C | C |

**1.**




$A(\widehat{ABC}) = 4\sqrt{3}\ cm^2 \Rightarrow \frac{\sqrt{3}\,a^2}{4} = 4\sqrt{3} \Rightarrow a = 4\ cm$

$h = \frac{\sqrt{3}}{2}a \Rightarrow h = 2\sqrt{3}\ cm$

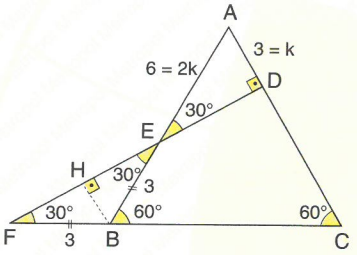
$|PF| + |PE| + |PD| = h$

$|PF| + 2\sqrt{3} + 1 - \sqrt{3} = 2\sqrt{3}\ cm$

$|PF| = \sqrt{3} - 1\ cm$

**Yanıt / Answer A**

**2.**



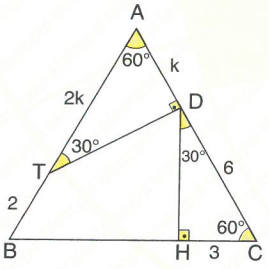

$\perp\ \widehat{ADE}\ (30°, 60°, 90°) \Rightarrow$

$|AD| = k = 3\ cm \Rightarrow |AE| = 2k = 6\ cm$

$|AB| = |BC| = |AC| = 9\ cm$

**Yanıt / Answer C**

**3.**




$\widehat{ABC}\ (60°, 60°, 60°) \Rightarrow$

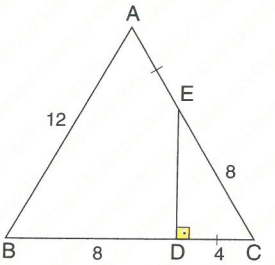
$|AC| = |AB| \Rightarrow 2k + 2 = k + 6 \Rightarrow k = 4\ cm$

$|AC| = 10\ cm \Rightarrow h = a \cdot \frac{\sqrt{3}}{2} = 5\sqrt{3}\ cm$

$A(\widehat{ABC}) = \frac{10 \cdot 5\sqrt{3}}{2} = 25\sqrt{3}\ cm^2$

**Yanıt / Answer D**

**4.**

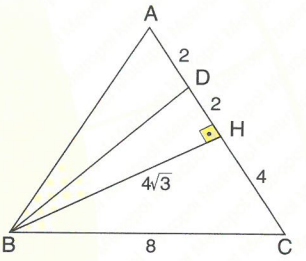



$|EC|^2 = |DC|^2 + |ED|^2$ [Pythagor]

$|ED| = \sqrt{8^2 - 4^2} = \sqrt{48} = 4\sqrt{3}\ cm$

**Yanıt / Answer B**

**5.**




$|AB| = |BC|$ & $|BH| \perp |AC| \Rightarrow |AH| = |HC|$

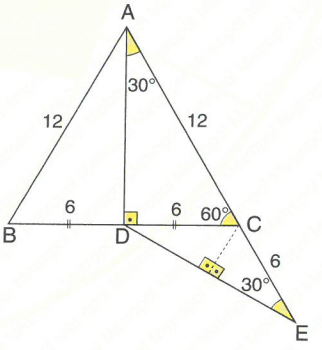
$|AD| = 2\ cm,\ |DC| = 6\ cm,\ |DH| = 2\ cm$

$|BH| = \sqrt{64 - 16} = 4\sqrt{3}\ cm$ [Pythagor]

$|BD| = \sqrt{48 + 4} = 2\sqrt{13}\ cm$ [Pythagor]

**Yanıt / Answer E**

**6.**



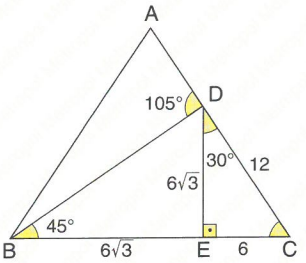

$|AC|^2 = |CD|^2 + |AD|^2$ [Pythagor]

$|AD| = \sqrt{12^2 - 6^2} = 6\sqrt{3}\ cm$ [Pythagor]

$|AD| = |DE| \Rightarrow |DE| = 6\sqrt{3}\ cm$

**Yanıt / Answer C**

**7.**




$\widehat{DEC}$ (30°, 60°, 90°) ⇒

$|DC| = 12 = 2k \Rightarrow |EC| = k = 6$ cm

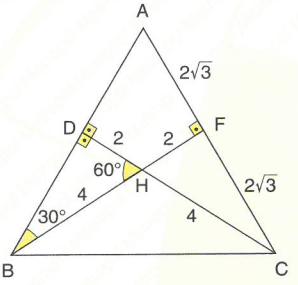
$|DE| = k\sqrt{3} = 6\sqrt{3}$ cm

$|DE| = |BE| \Rightarrow |BE| = 6\sqrt{3}$ cm

$|BC| = 6\sqrt{3} + 6$ cm

**Yanıt / Answer C**

**8.**




H ağırlık merkezidir. / H is center of the gravity.

$|HF| = 2$ cm

$\widehat{BHD} \sim \widehat{HFC} \Rightarrow |DH| = 2$ cm ve $|HC| = 4$ cm

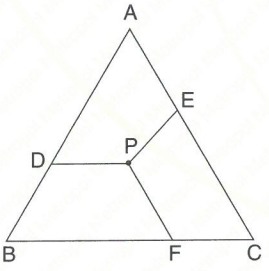
$|BD| = |FC| = |AD| = |AF| = 2\sqrt{3}$ cm

$\widehat{ABC}$ (60°, 60°, 60°) ⇒

Çevre / the perimeter $(\widehat{ABC}) = 12\sqrt{3}$ cm

**Yanıt / Answer E**

**9.**




$A(\widehat{ABC}) = 4\sqrt{3} \Rightarrow \dfrac{\sqrt{3}a^2}{4} = 4\sqrt{3}$ cm

$a^2 = 16 \Rightarrow a = 4$ cm

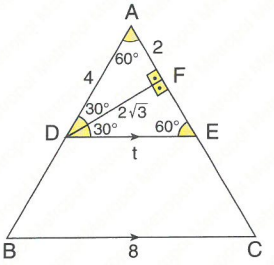
$|PD| + |PE| + |PF| = a$

$\sqrt{2} + (2 - \sqrt{2}) + |PF| = 4$ cm

$|PF| = 2$ cm

**Yanıt / Answer B**

**10.**




$|DE| \,//\, |BC| \Rightarrow \widehat{ADE}$ (60°, 60°, 60°)

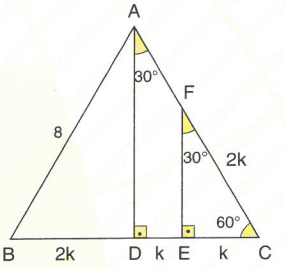
$|AF| = |FE| \Rightarrow |DF| \perp |AE|$

$|DF| = 2\sqrt{3}$ cm ⇒ $|AD| = 4$ cm

$|DB| = 8 - 4 = 4$ cm

**Yanıt / Answer E**

**11.**



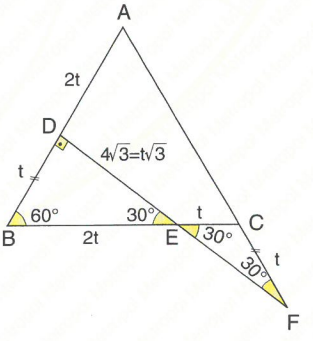

$\left.\begin{array}{l}\widehat{ADC}\ (30°, 60°, 90°)\\ \widehat{FEC}\ (30°, 60°, 90°)\end{array}\right\} \Rightarrow$

$4k = 8 \Rightarrow k = 2$ cm

$|EC| = k = 2$ cm ⇒ $|EF| = k\sqrt{3} = 2\sqrt{3}$ cm

**Yanıt / Answer C**

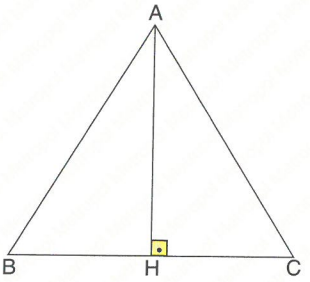
**12.**




$t\sqrt{3} = 4\sqrt{3} \Rightarrow t = 4$ cm ⇒ **$|AB| = 3t = 12$ cm**

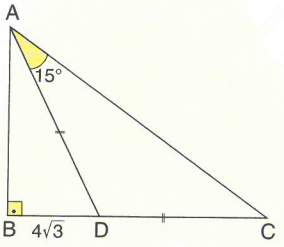
**Yanıt / Answer C**

1. $|AB| = |AC| = 20$ cm,
$|AH| = 16$ cm
$\Rightarrow$ **$|BC| = ?$ cm**



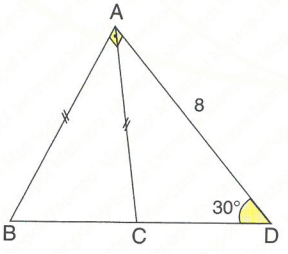

A) 24 B) 20 C) 18 D) 16 E) 14

2. $m(\widehat{B}) = 90°$,
$m(\widehat{DAC}) = 15°$,
$m(\widehat{BDA}) = 30°$,
$|AD| = |DC|$,
$|BD| = 4\sqrt{3}$ cm
$\Rightarrow$ **$A(\widehat{ADC}) = ?$ cm$^2$**



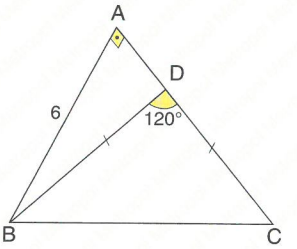

A) 8 B) $8\sqrt{3}$ C) 12 D) $12\sqrt{3}$ E) 16

3. $|AB| = |AC|$,
$|AD| = 8$ cm,
$m(\widehat{ADB}) = 30°$,
$m(\widehat{BAD}) = 90°$
$\Rightarrow$ **$A(\widehat{ABC}) = ?$ cm$^2$**



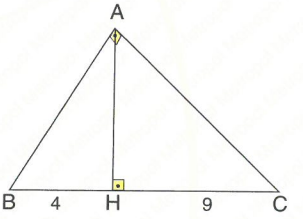

A) 16 B) $\frac{16\sqrt{3}}{3}$ C) $16\sqrt{3}$ D) 32 E) $32\sqrt{3}$

4. $|AB| = 6$ cm,
$m(\widehat{BAC}) = 90°$,
$m(\widehat{BDC}) = 120°$,
$|BD| = |DC|$
$\Rightarrow$ **$|BC| = ?$ cm**



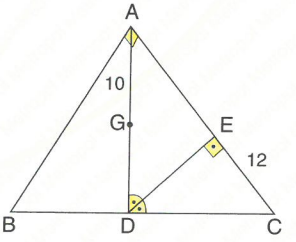

A) 5 B) 6 C) 8 D) 10 E) 12

5. $m(\widehat{BAC}) = 90°$,
$m(\widehat{AHC}) = 90°$,
$|HB| = 4$ cm,
$|HC| = 9$ cm
$\Rightarrow$ **$|AH| = ?$ cm**




A) 4 B) 5 C) 6 D) 7 E) 9

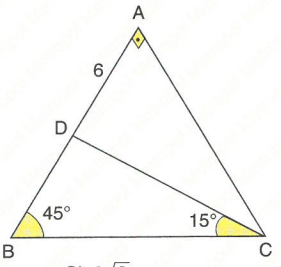
6.




G noktası ağırlık merkezidir. / G is center of the gravity.
$[AB] \perp [AC]$, $|AG| = 10$ cm, $|EC| = 12$ cm,
$m(\widehat{ADE}) = m(\widehat{EDC})$,
**Çevre / the perimeter $(\widehat{ADE}) = ?$ cm**

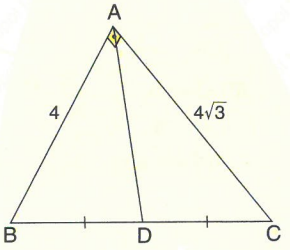
A) 12 B) 18 C) 24 D) 30 E) 36

**7.** [AB] ⊥ [AC],
$m(\widehat{ABC}) = 45°$,
$m(\widehat{DCB}) = 15°$,
IADI = 6 cm
⇒ **IBCI = ? cm**



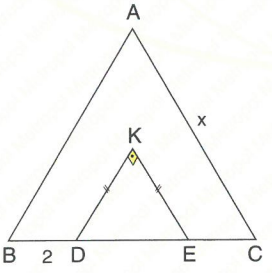

A) 6 B) $6\sqrt{2}$ C) $6\sqrt{3}$ D) $6\sqrt{6}$ E) $6\sqrt{7}$

**8.** IABI = 4 cm,
IACI = $4\sqrt{3}$ cm,
IBDI = IDCI
⇒ **$A(\widehat{ABD})$ = ? $cm^2$**



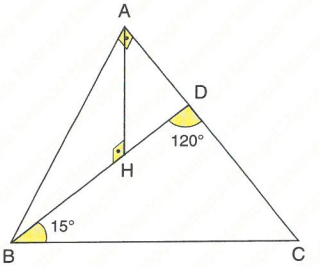

A) 4 B) $4\sqrt{3}$ C) 8 D) $8\sqrt{3}$ E) 12

**9.** ABC bir eşkenar üçgendir.
ABC is an equilateral triangle.
IKDI = IKEI,
IBDI = IECI = 2 cm,
IKEI = $2\sqrt{2}$ cm
⇒ **IACI = x = ? cm**



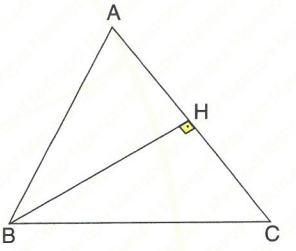

A) 4 B) 6 C) 8 D) 10 E) 12

**10.** $m(\widehat{BDC}) = 120°$,
$m(\widehat{DBC}) = 15°$,
IBHI = 3 cm
⇒ **IDCI = ? cm**



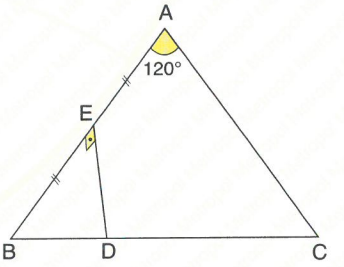

A) $4(\sqrt{3} - 1)$ B) $4(\sqrt{3} - 2)$ C) $2(\sqrt{3} - 1)$ D) $2(\sqrt{3} - 2)$ E) $4\sqrt{3}$

**11.** ABC bir eşkenar üçgendir.
ABC is an equilateral triangle.
[BH] ⊥ [AC],
$A(\widehat{ABC}) = 25\sqrt{3}$ $cm^2$
⇒ **IAHI = ? cm**




A) 5 B) $5\sqrt{3}$ C) 10 D) $10\sqrt{3}$ E) 15

**12.** IABI = IACI,
IBEI = IEAI,
[DE] ⊥ [AB],
$m(\widehat{BAC}) = 120°$,
IBDI = $2\sqrt{3}$ cm
⇒ **IDCI = ? cm**

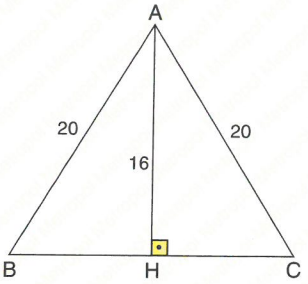



A) $\sqrt{3}$ B) $2\sqrt{3}$ C) $\sqrt{6}$ D) $3\sqrt{3}$ E) $4\sqrt{3}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | E | B | E | C | E | D | E | C | C | A | E |

**1.**

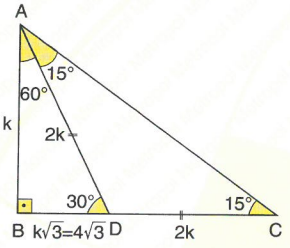



$|BH| = |HC| = \sqrt{20^2 - 16^2} = 12$ cm

$|BC| = 24$ cm

**Yanıt / Answer A**

**2.**



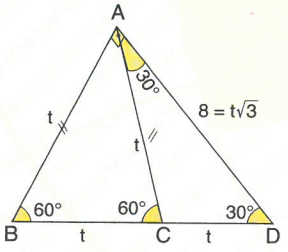

$k\sqrt{3} = 4\sqrt{3} \Rightarrow k = 4$ cm

$|AB| = 4$ cm, $|DC| = 8$ cm

$A(ADC) = \frac{4.8}{2} = 16$ cm$^2$

**Yanıt / Answer E**

**3.**



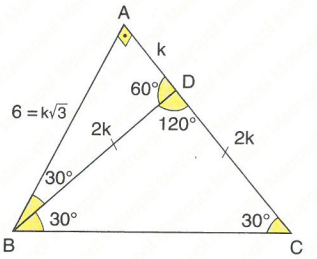

$\sqrt{3}\,t = 8$ cm $\Rightarrow t = \frac{8}{\sqrt{3}} = \frac{8\sqrt{3}}{3}$ cm

$A(\widehat{ABC}) = A(\widehat{ACD}) = \frac{A(\widehat{ABD})}{2}$

$= \frac{\frac{8\sqrt{3}}{3} \cdot 8}{2} = \frac{16\sqrt{3}}{3}$ cm$^2$

**Yanıt / Answer**

**4.**

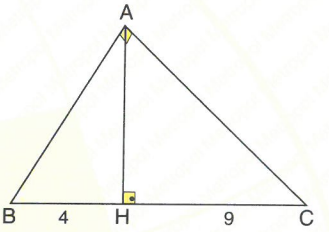



$\Rightarrow |AB| = k\sqrt{3} = 6 \Rightarrow k = 2\sqrt{3}$ cm

$|BC| = 2k\sqrt{3} = 12$ cm

**Yanıt / Answer E**

**5.**

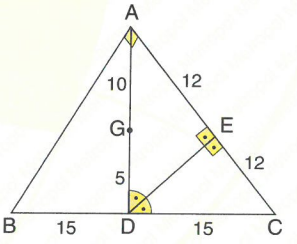



$|AH|^2 = 4 \cdot 9$ [Euclid ]

$|AH| = 6$ cm

**Yanıt / Answer C**

**6.**




$|GD| = 5$ cm $\Rightarrow |BD| = |DC| = 15$ cm

$[AB] \perp [AC] \Rightarrow |AD| = |BD| = |DC| = 15$ cm

$m(\widehat{ADE}) = m(\widehat{EDC}) \Rightarrow |AE| = |EC| = 12$ cm

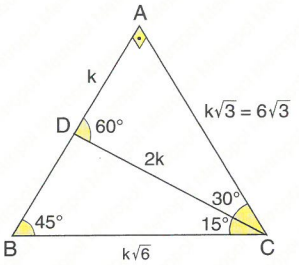
$|DE| = \sqrt{|AD|^2 - |AE|^2}$ [Pythagor]

$|DE| = \sqrt{15^2 - 12^2} = 9$ cm

$Ç(\widehat{ADE}) = 15 + 12 + 9 = 36$ cm

**Yanıt / Answer E**

**7.**



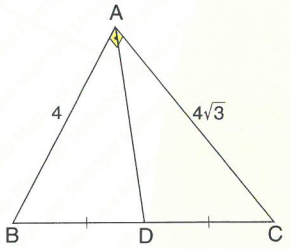

Şekildeki veriler kullanılarak aşağıdaki sonuç bulunur.

By using given the informations in the figure, we obtain following result.

$|AC| = k\sqrt{3} = 6\sqrt{3} \Rightarrow k = 6 = |BC| = 6\sqrt{6}$ cm

**Yanıt / Answer D**

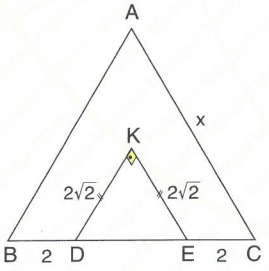
**8.**




$$A(\widehat{ABD}) = \frac{A(\widehat{ABC})}{2} = \frac{\frac{4.4\sqrt{3}}{2}}{2} = 4\sqrt{3}\ cm^2$$

**Yanıt / Answer B**

**9.**



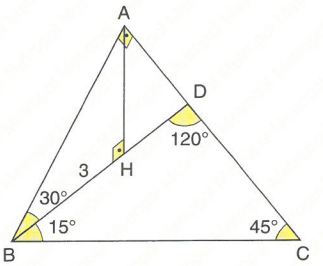

$\widehat{KDE}$ $(45°, 45°, 90°)$

$\Rightarrow |DE| = \sqrt{(2\sqrt{2})^2 + (2\sqrt{2})^2} = 4$ cm

$|AC| = |BC| = 8$ cm

**Yanıt / Answer C**

**10.**




$|AC| = |AB| = \frac{2}{\sqrt{3}}.3 = 2\sqrt{3}$ cm

$|AH| = \sqrt{3}$ cm $\Rightarrow |AD| = \frac{2}{\sqrt{3}}.\sqrt{3} = 2$ cm

$|DC| = 2\sqrt{3} - 2 = 2.(\sqrt{3} - 1)$ cm

**Yanıt / Answer C**

**11.** $\widehat{ABC}$ $(60°, 60°, 60°)$

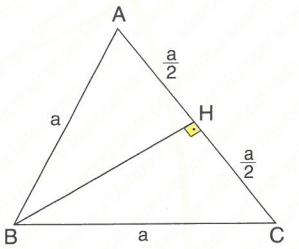
$A(\widehat{ABC}) = \frac{\sqrt{3}}{4}a^2$

$25\sqrt{3} = \frac{\sqrt{3}a^2}{4}$

$a^2 = 100\ cm^2$

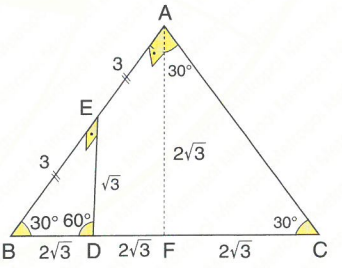
$a = 10$ cm

$\Rightarrow |AH| = \frac{a}{2} = 5$ cm




**Yanıt / Answer A**

**12.**




$|BD| = 2\sqrt{3}$ cm $\Rightarrow |ED| = \sqrt{3}$ cm

$BED \sim BAF \Rightarrow$

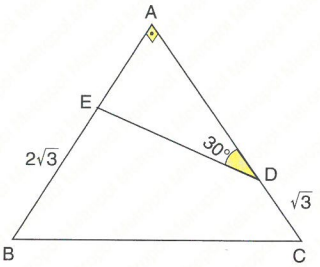
$\frac{|BE|}{|ED|} = \frac{|BA|}{|AF|} \Rightarrow \frac{3}{\sqrt{3}} = \frac{6}{|AF|}$

$|AF| = 2\sqrt{3} \Rightarrow |BF| = 4\sqrt{3}$

$|AF| = |FC| = 2\sqrt{3} \Rightarrow |DC| = 2\sqrt{3} + 2\sqrt{3} = 4\sqrt{3}$

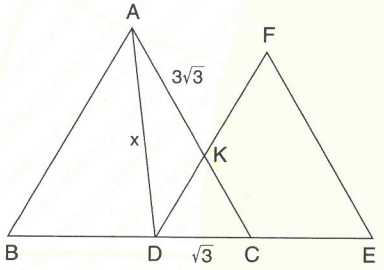
**Yanıt / Answer E**

**1.** [AB] ⊥ [AC],
IABI = IACI,
$m(\widehat{ADE}) = 30°$,
IEBI = $2\sqrt{3}$ cm,
IDCI = $\sqrt{3}$ cm
⇒ **IAEI = ? cm**




A) $\frac{3+\sqrt{3}}{4}$ B) $\frac{3+\sqrt{3}}{2}$ C) $\frac{3+2\sqrt{3}}{2}$ D) $\frac{3+5\sqrt{3}}{2}$ E) $\frac{3+5\sqrt{3}}{4}$

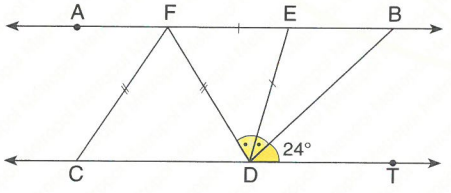
**2.**




IABI = IACI = IBCI, IFDI = IFEI = IDEI,
⇒ **IADI = x = ? cm**

A) $\sqrt{39}$ B) $2\sqrt{39}$ C) $3\sqrt{39}$ D) $3\sqrt{13}$ E) $6\sqrt{13}$

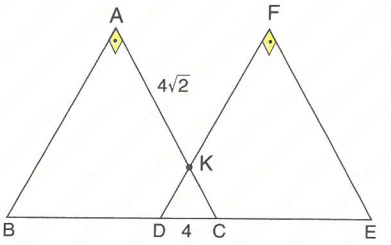
**3.**




IABI // ICTI, IFEI = IEDI, IFCI = IFDI,
$m(\widehat{FDE}) = m(\widehat{EDB})$, $m(\widehat{BDT}) = 24°$ ⇒ **$m(\widehat{AFC})$ = ?**

A) 48° B) 52° C) 64° D) 72° E) 81°

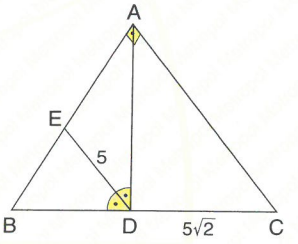
**4.**




IABI = IACI, IFDI = IFEI, IAKI = $4\sqrt{2}$ cm,
IDCI = 4 cm ⇒ **IBDI = ? cm**

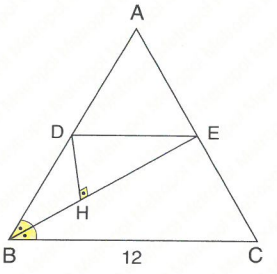
A) 4 B) 6 C) 8 D) $8\sqrt{2}$ E) 16

**5.** [AB] ⊥ [AC],
IBDI = IDCI,
IDCI = $5\sqrt{2}$ cm,
IDEI = 5 cm
⇒ **$A(\widehat{ADC})$ = ? cm²**



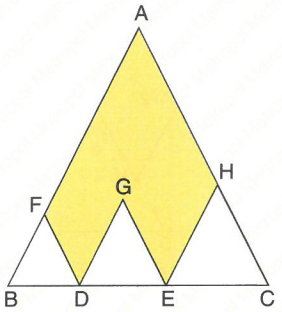

A) $\frac{5}{2}$ B) $\frac{5\sqrt{2}}{2}$ C) $\frac{25}{2}$ D) 25 E) $\frac{5\sqrt{10}}{2}$

**6.** [DE] // [BC],
IABI = IBCI = ICAI,
$m(\widehat{ABE}) = m(\widehat{EBC})$,
IBCI= 12 cm
⇒ **IHEI = ? cm**




A) 3 B) $3\sqrt{3}$ C) $\sqrt{6}$ D) $6\sqrt{2}$ E) $6\sqrt{3}$

**7.**




FBD, GDE ve HEC birer eşkenar üçgendir.

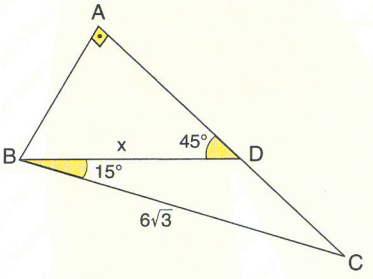
FBD, GDE ve HEC are equilateral triangles.

IABI = IACI = IBCI, 4·IBDI = 2·IDEI = IECI

$\Rightarrow \dfrac{A(\widehat{ABC})}{A(AFDGEH)} = ?$

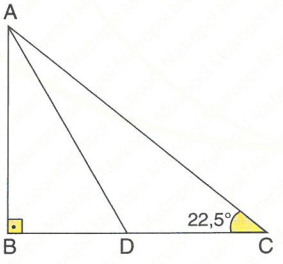
A) $\frac{7}{4}$ B) $\frac{7}{2}$ C) $\frac{3}{2}$ D) $\frac{4}{3}$ E) $\frac{9}{7}$

**8.** IBCI = $6\sqrt{3}$ cm,
$m(\widehat{DBC}) = 15°$,
$m(\widehat{A}) = 90°$,
$m(\widehat{BDA}) = 45°$
$\Rightarrow$ **IBDI = ? cm**



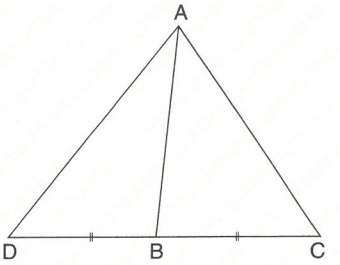

A) 6 B) $2\sqrt{3}$ C) $2\sqrt{5}$ D) $3\sqrt{6}$ E) $3\sqrt{3}$

**9.** IADI = IDCI,
IADI = $2\sqrt{2}$ cm
$\Rightarrow$ **IACI = ? cm**



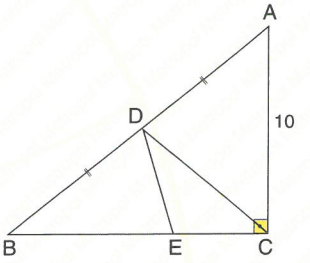

A) $\sqrt{2+2\sqrt{2}}$ B) $2\sqrt{2+2\sqrt{2}}$
C) $2\sqrt{4+2\sqrt{2}}$ D) $4\sqrt{4+2\sqrt{2}}$
E) $\sqrt{8+2\sqrt{2}}$

**10.** IABI = IACI = IBCI,
$Ih_aI = 8$ cm
$\Rightarrow$ **IADI = ? cm**



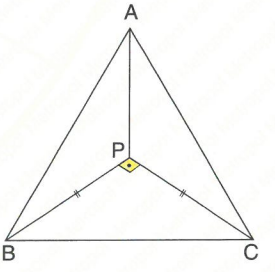

A) 12 B) 14 C) 16 D) 18 E) 20

**11.** $m(\widehat{ACB}) = 90°$,
IADI = IDBI,
IACI = 10 cm,
IECI = 6 cm
$\Rightarrow$ **$A(\widehat{DEC})$ = ? cm$^2$**




A) 8 B) 10 C) 12 D) 15 E) 30

**12.** IABI = IACI = IBCI,
[BP] ⊥ [PC],
IAPI = $4\sqrt{3} - 4$ cm
$\Rightarrow$ **IACI = ? cm**

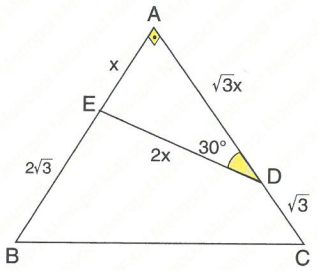



A) 2 B) 4 C) $4\sqrt{3}$ D) 8 E) $8\sqrt{3}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | A | B | C | D | B | A | D | C | C | D | D |

**1.**




$|AB| = |AC| \Rightarrow x + 2\sqrt{3} = \sqrt{3} + \sqrt{3}x$

$2\sqrt{3} - \sqrt{3} = \sqrt{3x} \cdot -x$

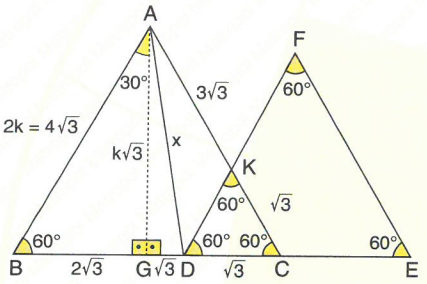
$x = \dfrac{\sqrt{3}.}{\sqrt{3}-1} \Rightarrow x = \dfrac{\sqrt{3}.(\sqrt{3}+1)}{3-1}$

$(\sqrt{3}+1)$

$x = \dfrac{3+\sqrt{3}}{2}$ cm

**Yanıt / Answer B**

**2.**




ABC ve FDE birer eşkenar üçgen olduğuna göre KDC de eşkenar üçgendir. / ABC and FDE are equilateral triangles. So, KDC is an equilateral triangle.

$|AB| = 2k = 4\sqrt{3}$ cm $\Rightarrow$ $k = 2\sqrt{3}$ cm

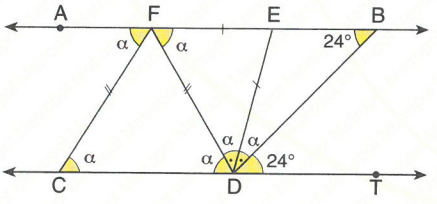
$|AG| = k\sqrt{3} = 6$ cm, $|GD| = \sqrt{3}$ cm

$|AD|^2 = 6^2 + (\sqrt{3})^2 = 39$ [Pythagor]

$|AD| = \sqrt{39}$ cm

**Yanıt / Answer A**

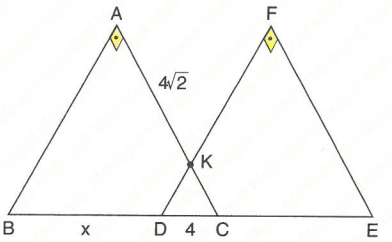
**3.**




$3\alpha + 24° = 180° \Rightarrow \alpha = 52°$

**Yanıt / Answer B**

**4.**




$\perp \widehat{KDC}$ (45°, 45°, 90°)

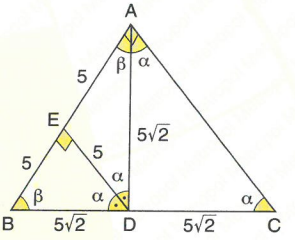
$|DC| = 4$ cm $\Rightarrow$ $|DK| = |KC| = 2\sqrt{2}$ cm

$|AC| = 4\sqrt{2} + 2\sqrt{2} = 6\sqrt{2}$ cm

$|BC| = (6\sqrt{2})\cdot\sqrt{2} = 12$ cm $\Rightarrow$ $x = 8$ cm

**Yanıt / Answer C**

**5.**




$\left.\begin{array}{l}[BA] \perp [AC] \\ |BD| = |DC|\end{array}\right\}$

$|DC| = |AD| = |ED| = 5\sqrt{2}$ cm

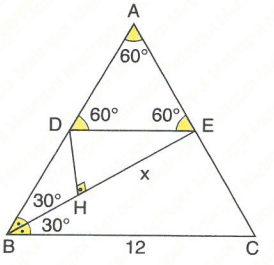
$|AE| = |EB| = |ED| = 5$ cm

$A(\widehat{ADC}) = A(\widehat{ABD}) = \dfrac{5 \cdot 10}{2} = 25$ cm$^2$

**Yanıt / Answer D**

**6.** ADE bir eşkenar üçgendir.

ADE is an equilateral triangle.




$\left.\begin{array}{l}|DE| = |AD| = |AE| = \dfrac{2x}{\sqrt{3}} \\ |DH| = \dfrac{x}{\sqrt{3}} \Rightarrow |BD| = \dfrac{2x}{\sqrt{3}}\end{array}\right\} \Rightarrow$

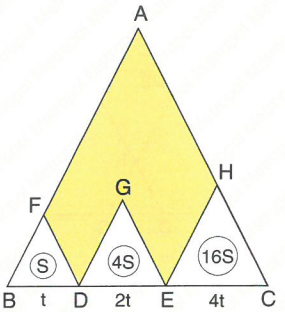
$|AD| = |BD|$

$|DE| = \dfrac{|BC|}{2}$

$\dfrac{2x}{\sqrt{3}} = \dfrac{12}{2} \Rightarrow x = 3\sqrt{3}$ cm

**Yanıt / Answer B**

**7.**




$S = A(FBD) = \frac{\sqrt{3}t^2}{4}$

$A(\widehat{GDE}) = \frac{\sqrt{3}\cdot(2t)^2}{4} = 4S$

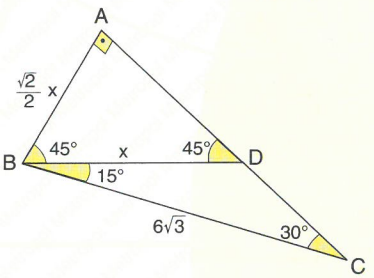
$\frac{A(\widehat{HCE})}{3} = \frac{\sqrt{3}\cdot(4t)^2}{3} = 16S$

$A(\widehat{ABC}) = \frac{\sqrt{3}\cdot(7t)^2}{4} = 49S$

$\Rightarrow \frac{A(\widehat{ABC})}{A(AFDGEH} = \frac{49\cdot S}{28\cdot S} = \frac{7}{4}$

**Yanıt / Answer A**

**8.**




$|BD| = x \Rightarrow |AB| = |AD| = \frac{\sqrt{2}x}{2}$

$2\cdot\left(\frac{\sqrt{2}x}{2}\right) = 6\sqrt{3} \Rightarrow x = \frac{6\sqrt{3}}{\sqrt{2}} = 3\sqrt{6}$ cm

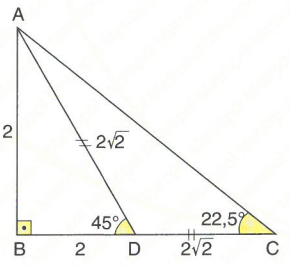
**Yanıt / Answer D**

**9.** $|AB| = |BD| = 2$ cm

$|AC| = \sqrt{2^2 + (2+2\sqrt{2})^2}$

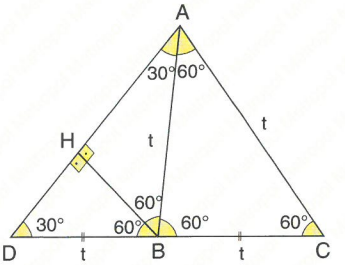
$= \sqrt{16+8\sqrt{2}}$

$= 2\sqrt{4+2\sqrt{2}}$ cm




**Yanıt / Answer C**

**10.**



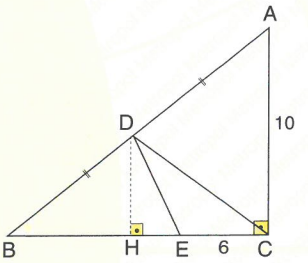

$\widehat{HDB}$ (30°, 60°, 90°)

$h_a = 8$ cm $\Rightarrow \frac{\sqrt{3}}{2}t = 8$ cm $\Rightarrow t = \frac{16}{\sqrt{3}} = \frac{16\sqrt{3}}{3}$ cm

$|AD| = \sqrt{3}t = \frac{\sqrt{3}\cdot(16\sqrt{3})}{3} \Rightarrow |AD| = 16$ cm

**Yanıt / Answer C**

**11.**




$\widehat{BDH} \sim \widehat{BAC} \Rightarrow$

$\frac{|BD|}{|BA|} = \frac{|DH|}{|AC|} \Rightarrow \frac{1}{2} = \frac{|DH|}{10}$

$|DH| = \frac{10}{2} = 5$ cm

$A(\widehat{DEC}) = \frac{5\cdot 6}{2} = 15$ cm$^2$

**Yanıt / Answer D**

**12.** $|AP| = 4\sqrt{3} - 4$ cm

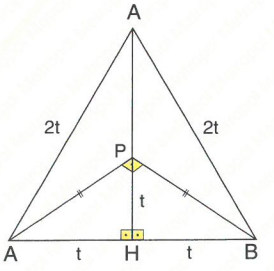
$|AH| = \frac{\sqrt{3}}{2}\cdot(2t) = \sqrt{3}t$

$4\sqrt{3} - 4 + t = \sqrt{3}t$

$t = \frac{4\sqrt{3}-4}{\sqrt{3}-1}$ cm

$t = \frac{4\cdot(\sqrt{3}-1)}{\sqrt{3}-1} =$ cm

$|AC| = 2t = 8$ cm




**Yanıt / Answer D**

**1.** [BA] ⊥ [AC],

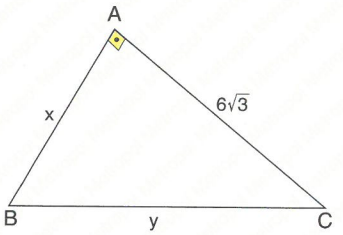
$2 \cdot m(\widehat{ACB}) = m(\widehat{ABC})$,

$|AC| = 6\sqrt{3}$ cm

$|AB| = x$ cm,

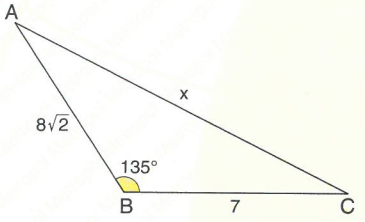
$|BC| = y$ cm

$\Rightarrow$ **x + y = ? cm**




A) 9 B) 12 C) 15 D) 18 E) 21

**2.**

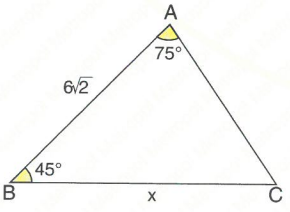



$m(\widehat{ABC}) = 135°$, $|AB| = 8\sqrt{2}$ cm, $|BC| = 7$ cm

$\Rightarrow$ **|AC| = x = ? cm**

A) 15 B) 17 C) 21 D) 24 E) 25

**3.**

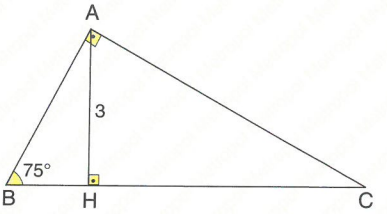



$m(\widehat{ABC}) = 45°$, $m(\widehat{BAC}) = 75°$, $|AB| = 6\sqrt{2}$ cm,

$\Rightarrow$ **|BC| = x = ? cm**

A) 9 B) $9\sqrt{2}$ C) $8\sqrt{3}$ D) $9\sqrt{3}$ E) $6 + 2\sqrt{3}$

**4.**




[AB] ⊥ [AC], [AH] ⊥ [BC], $m(\widehat{ACB}) = 75°$, $|AH| = 3$ cm

$\Rightarrow$ **|BC| = x = ? cm**

A) 6 B) 8 C) 9 D) 10 E) 12

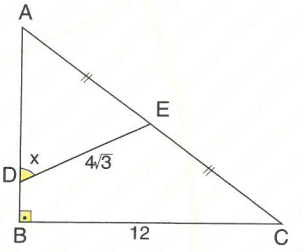
**5.** [BA] ⊥ [BC],

$|AE| = |EC|$,

$|BC| = 12$ cm

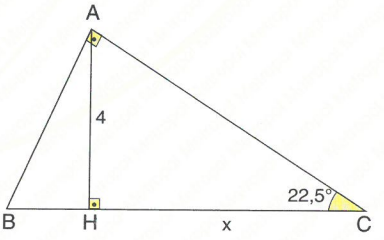
$|DE| = 4\sqrt{3}$ cm

$\Rightarrow$ **$m(\widehat{ADE}) = x = ?$**




A) 30° B) 45° C) 60° D) 75° E) 90°

**6.**

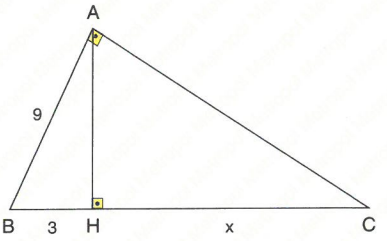



[AB] ⊥ [AC], [AH] ⊥ [BC], $m(\widehat{ACB}) = 22{,}5°$,

$|AH| = 4$ cm $\Rightarrow$ **|HC| = x = ? cm**

A) $4 + 4\sqrt{2}$ B) $6 + 2\sqrt{2}$ C) $6 + 4\sqrt{2}$ D) $8 + 2\sqrt{2}$ E) $8 + 4\sqrt{2}$

**7.**

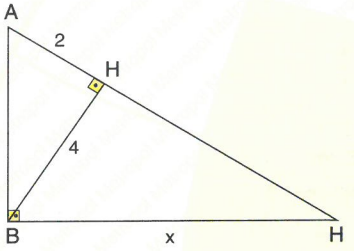



[AB] ⊥ [AC], [AH] ⊥ [BC], IABI = 9 cm, IBHI = 3 cm,

⇒ **IHCI = x = ? cm**

A) 12 B) 18 C) 20 D) 22 E) 24

**8.**

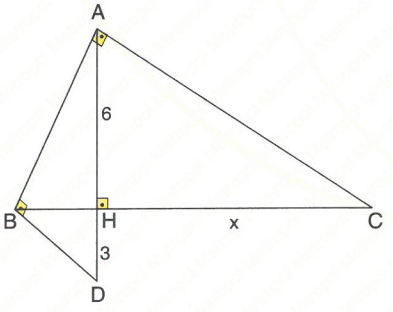



[AB] ⊥ [BC], [BH] ⊥ [AC], IBHI = 4 cm, IAHI = 2 cm

⇒ **IBCI = x = ? cm**

A) $2\sqrt{3}$ B) $4\sqrt{3}$ C) $2\sqrt{5}$ D) $4\sqrt{5}$ E) 8

**9.**

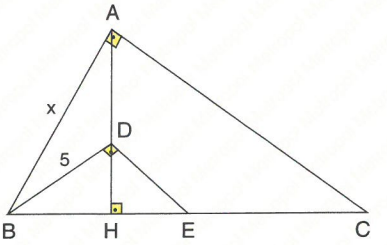



[AB] ⊥ [AC], [AH] ⊥ [BC], [AB] ⊥ [BD], IAHI = 6 cm,

IHDI = 3 cm ⇒ **IHCI = x = ? cm**

A) $3\sqrt{2}$ B) $3\sqrt{3}$ C) $6\sqrt{2}$ D) $4\sqrt{3}$ E) $9\sqrt{2}$

**10.**

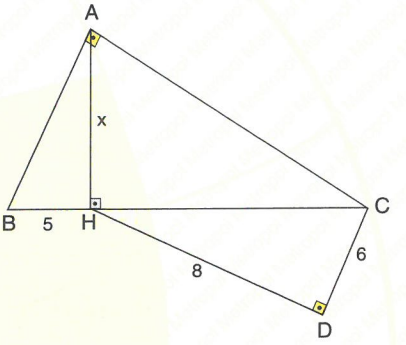



[AB] ⊥ [AC], [BD] ⊥ [DE], [AH] ⊥ [BC], IBEI = IECI,

IDBI = 5 cm ⇒ **IABI = x = ? cm**

A) $5\sqrt{2}$ B) $5\sqrt{3}$ C) 10 D) $10\sqrt{2}$ E) $10\sqrt{3}$

**11.**

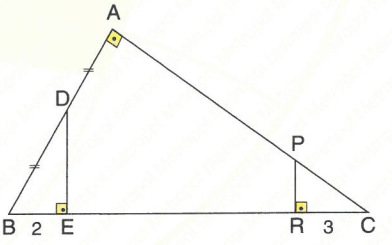



[AB] ⊥ [AC], [AH] ⊥ [BC], [CD] ⊥ [HD], ICDI = 6 cm,

IHDI = 8 cm, IBHI = 5 cm ⇒ **IAHI = x = ? cm**

A) $3\sqrt{2}$ B) $4\sqrt{2}$ C) $5\sqrt{2}$ D) $4\sqrt{3}$ E) $5\sqrt{3}$

**12.**




BA] ⊥ [AC], [DE] ⊥ [BC], [PR] ⊥ [BC], IADI = IDBI,

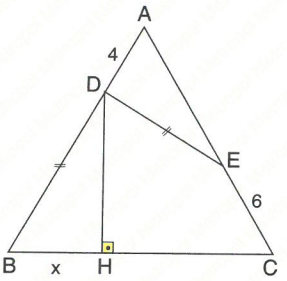
IDEI = 2·IPRI, IBEI = 2 cm, IRCI = 3 cm ⇒ **IERI = ? cm**

A) 9 B) 11 C) 13 D) 14 E) 15

**YANITLAR / ANSWERS**

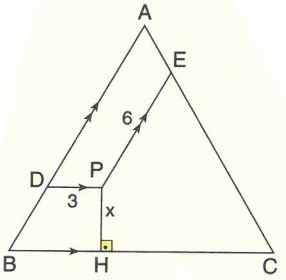
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | B | E | E | C | A | E | D | C | A | C | B |

**1.** ABC, eşkenar üçgendir.
ABC is an equilateral triangle.
[DH] ⊥ [BC],
IBDI = IDEI,
IADI = 4 cm,
IECI = 6 cm
⇒ **IBHI = x = ? cm**



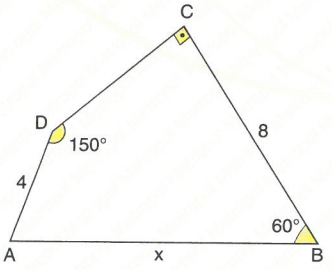

A) $\frac{7}{4}$ B) $\frac{7}{2}$ C) $\frac{9}{4}$ D) $\frac{9}{2}$ E) $\frac{11}{4}$

**2.** ABC, eşkenar üçgendir.
ABC is an equilateral triangle.
[AB] // [PE], [DP] // [BC],
[PH] ⊥ [BC],
IPDI = 3 cm,
IPEI = 6 cm,
IACI = 13 cm
⇒ **IPHI = x = ? cm**



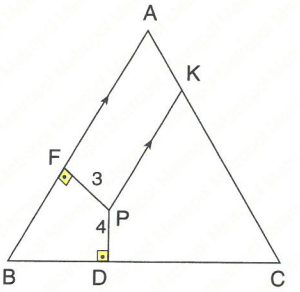

A) $\frac{\sqrt{3}}{2}$ B) $\sqrt{3}$ C) $\frac{3\sqrt{3}}{2}$ D) $2\sqrt{3}$ E) $\frac{5\sqrt{3}}{2}$

**3.** [DC] ⊥ [CB],
m($\widehat{CDA}$) = 150°,
m($\widehat{ABC}$) = 60°,
ICBI = 8 cm,
IADI = 4 cm
⇒ **IABI = x = ? cm**



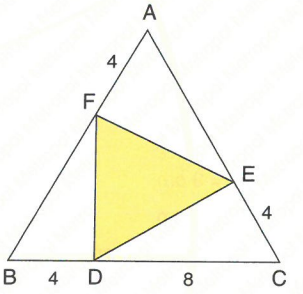

A) 10 B) 12 C) 13 D) 14 E) 16

**4.** ABC, eşkenar üçgendir.
ABC is an equilateral triangle.
[PD] ⊥ [BC], [PF] ⊥ [AB],
[PK] // [AB], IPDI = 4 cm,
IPFI = 3 cm,
IABI = $10\sqrt{3}$ cm
⇒ **IPKI = x = ? cm**



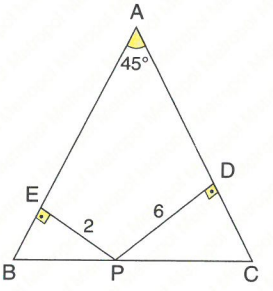

A) $2\sqrt{3}$ B) $3\sqrt{3}$ C) $\frac{16\sqrt{3}}{3}$ D) 6 E) $\frac{20\sqrt{3}}{3}$

**5.** ABC, eşkenar üçgendir.
ABC is an equilateral triangle.
IAFI = IECI = IBDI = 4 cm,
IDCI = 8 cm
⇒ **A($\widehat{DEF}$) = ? cm²**



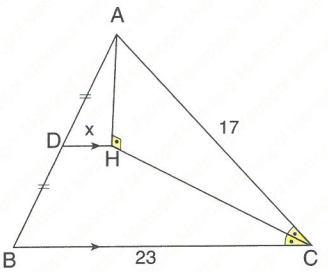

A) $8\sqrt{3}$ B) $9\sqrt{3}$ C) $10\sqrt{3}$ D) $12\sqrt{3}$ E) $16\sqrt{3}$

**6.** IABI = IACI,
m($\widehat{BAC}$) = 45°,
IEPI = 2 cm,
IPDI = 6 cm
⇒ **A($\widehat{ABC}$) = ? cm²**



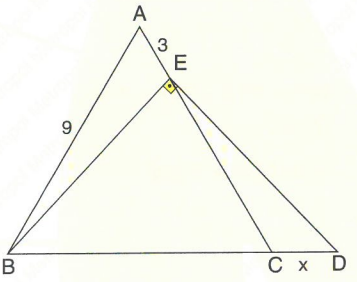

A) $8\sqrt{2}$ B) $16\sqrt{2}$ C) $24\sqrt{2}$ D) $28\sqrt{2}$ E) $32\sqrt{2}$

**7.** $m(\widehat{ACH}) = m(\widehat{HCB})$,
[AH] ⊥ [HC],
[DH] // [BC],
IADI = IDBI,
IACI = 17 cm,
IBCI = 23 cm
⇒ **IDHI = x = ? cm**



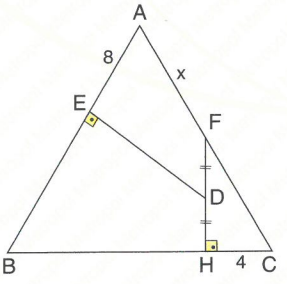

A) 1 B) $\frac{3}{2}$ C) 2 D) $\frac{5}{2}$ E) 3

**8.** ABC, eşkenar üçgendir.
ABC is an equilateral triangle.
[BE] ⊥ [ED],
IABI = 9 cm,
IAEI = 3 cm
⇒ **ICDI = x = ? cm**



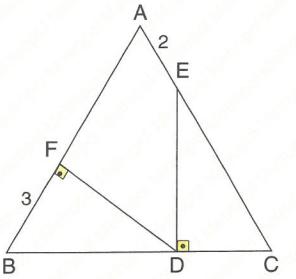

A) $\frac{3}{2}$ B) $\frac{5}{2}$ C) 3 D) $\frac{7}{2}$ E) 4

**9.** ABC, eşkenar üçgendir.
ABC is an equilateral triangle.
[FH] ⊥ [BC],
[DE] ⊥ [AB],
IFDI = IDHI,
IHCI = 4 cm,
IAEI = 8 cm ⇒
**IAFI = x = ? cm**



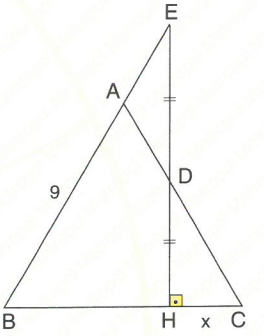

A) 6 B) 7 C) 8 D) 9 E) 10

**10.** ABC, eşkenar üçgendir.
ABC is an equilateral triangle.
[ED] ⊥ [BC],
[DF] ⊥ [AB],
IAEI = 2 cm,
IFBI = 3 cm ⇒
**IBCI = x = ? cm**



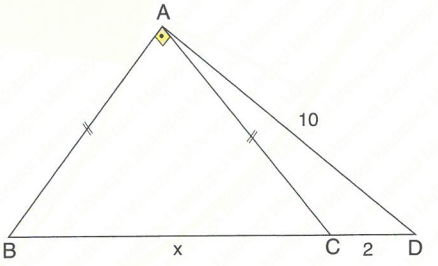

A) 8 B) 9 C) 10 D) 14 E) 15

**11.** ABC, eşkenar üçgendir.
ABC is an equilateral triangle.
[EH] ⊥ [BC],
IEDI = IDHI,
IABI = 9 cm ⇒
⇒ **IHCI = x = ? cm**




A) $\frac{3}{2}$ B) 2 C) $\frac{5}{2}$ D) 3 E) $\frac{7}{2}$

**12.**



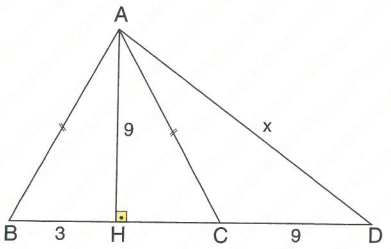

[AB] ⊥ [AC], IABI = IACI, IADI = 10 cm,
ICDI = 2 cm ⇒ **IBCI = x = ? cm**

A) 10 B) 11 C) 12 D) 13 E) 14

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | D | B | C | D | E | E | A | E | C | D | C |

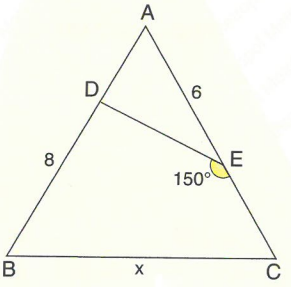
**1.**




IABI = IACI, [AH] ⊥ [BC], IAHI = ICDI = 9 cm,
IBHI = 3 cm ⇒ **IADI = x = ? cm**

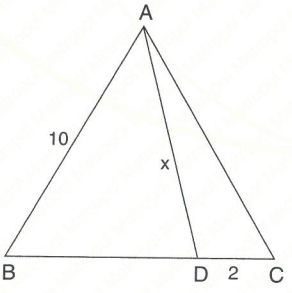
A) 10 B) 11 C) 12 D) 14 E) 15

**2.** ABC, eşkenar üçgendir.
ABC is an equilateral triangle.
m($\widehat{DEC}$) = 150°,
IAEI = 6 cm,
IDBI = 8 cm
⇒ **IBCI = x = ? cm**



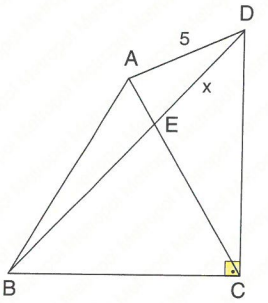

A) 10 B) 11 C) 12 D) 13 E) 14

**3.** ABC, eşkenar üçgendir.
ABC is an equilateral triangle.
IABI = 10 cm,
IDCI = 2 cm
⇒ **IADI = x = ? cm**



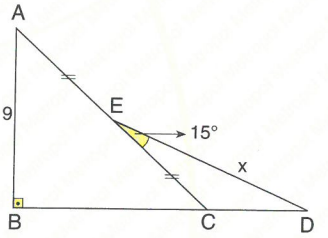

A) $2\sqrt{21}$ B) $3\sqrt{17}$ C) $4\sqrt{13}$ D) $3\sqrt{21}$ E) $4\sqrt{27}$

**4.** ABC, eşkenar üçgendir.
ABC is an equilateral triangle.
[DC] ⊥ [BC],
IDCI = IBCI,
IADI = 5 cm
⇒ **IDEI = x = ? cm**



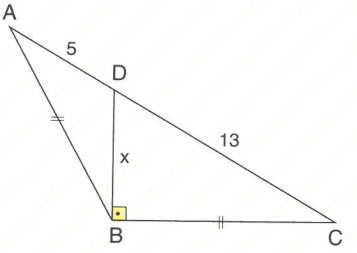

A) $3\sqrt{2}$ B) $3\sqrt{3}$ C) 5 D) $5\sqrt{2}$ E) $5\sqrt{3}$

**5.** IAEI = IECI,
IABI = IBCI,
[AB] ⊥ [BC],
m($\widehat{CED}$) = 15°,
IABI = 9 cm
⇒ **IEDI = x = ? cm**




A) 6 B) 7 C) 8 D) 9 E) 10

**6.** IABI = IBCI,
[DB] ⊥ [BC],
IADI = 5 cm,
IDCI = 13 cm
⇒ **IBDI = x = ? cm²**




A) $\sqrt{13}$ B) $2\sqrt{13}$ C) $3\sqrt{6}$ D) $4\sqrt{6}$ E) $3\sqrt{13}$

**7.** ABC, eşkenar üçgendir.

ABC is an equilateral triangle.

[PE] ⊥ [AE],

[PF] ⊥ [AF],

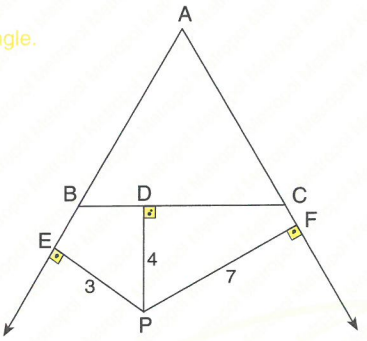
[PD] ⊥ [BC],

IPEI = 3 cm,

IPDI = 4 cm,

IPFI = 7 cm

⇒ **A($\widehat{ABC}$) = ? cm²**




A) $6\sqrt{3}$ B) $9\sqrt{3}$ C) $12\sqrt{3}$ D) $15\sqrt{3}$ E) $18\sqrt{3}$

**8.** IABI = IACI,

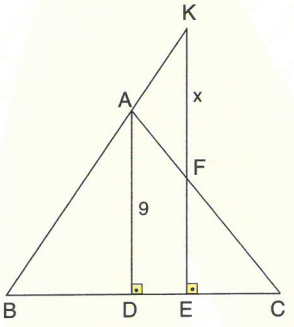
[AD] ⊥ [BC],

[KE] ⊥ [BC],

IADI = 9 cm,

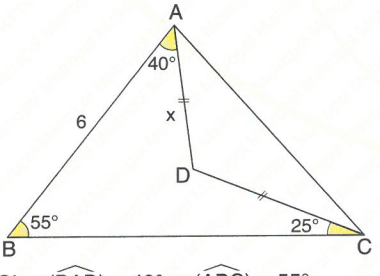
IKEI = 12 cm

⇒ **IKFI = x = ? cm**




A) 5 B) 6 C) 7 D) 8 E) 9

**9.**




IADI = IDCI, m($\widehat{BAD}$) = 40°, m($\widehat{ABC}$) = 55°,

m($\widehat{DCB}$) = 25°, IABI = 6 cm ⇒ **IADI = x = ? cm**

A) $2\sqrt{3}$ B) $3\sqrt{3}$ C) $4\sqrt{3}$ D) $2\sqrt{5}$ E) $3\sqrt{5}$

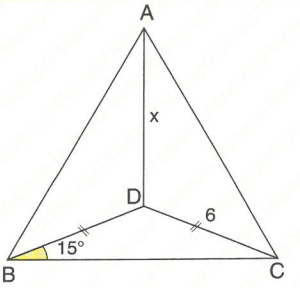
**10.** ABC, eşkenar üçgendir.

ABC is an equilateral triangle.

IBDI = IDCI = 6 cm

m($\widehat{DBC}$) = 15°

⇒ **IADI = x = ? cm**



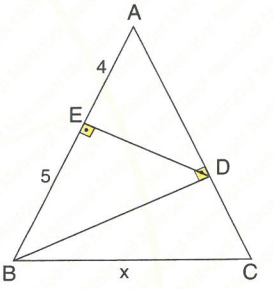

A) $3\sqrt{3}$ B) $4\sqrt{3}$ C) $6\sqrt{2}$ D) $9\sqrt{2}$ E) $6\sqrt{3}$

**11.** IABI = IACI,

IAEI = 4 cm,

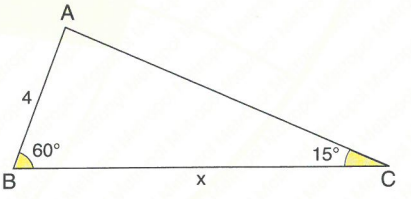
IEBI = 5 cm

⇒ **IBCI = x = ? cm**




A) $2\sqrt{5}$ B) $3\sqrt{5}$ C) $2\sqrt{6}$ D) $3\sqrt{6}$ E) $4\sqrt{6}$

**12.**




m($\widehat{ABC}$) = 60°, m($\widehat{ACB}$) = 15°, IABI = 4 cm

⇒ **IBCI = x = ? cm**

A) $4 + 2\sqrt{3}$ B) $4 + 4\sqrt{3}$ C) $6 + 2\sqrt{3}$ D) $6 + 4\sqrt{3}$ E) $8 + 4\sqrt{3}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | B | A | C | D | B | C | B | A | C | D | E |

# BÖLÜM CHAPTER 5

## TARİHSEL NOT / HISTORICAL NOTE

### Thales of Miletus [624 – 546 BC]

Yunan filozof, matematikçi ve astronomdur. Yunanistan'ın yedi bilgelerinden biriydi. Çoğu, en başta Aristoteles, onu Yunan geleneğinde ilk filozof olarak kabul etti ve tarihsel olarak Batı medeniyetinde bilimsel felsefe ile ilgilendiği bilinen ilk birey olarak kabul edildi.

A Greek philosopher mathematician and astronomer. He was one of the seven wisdoms of Greece. A lot of people, first and foremost Aristotle, regarded him as the first philosopher in the Greek tradition. He was regarded as the first person known historically to be engaged with scientific philosophy in Western civilization.

# ÜÇGENLERDE BENZERLİK ve ALAN
# SIMILARITY and AREA in TRIANGLES

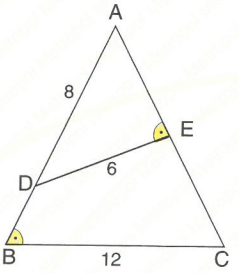
**Bu bölüm 120 çözümlü test sorusu ve 84 test sorusu içermektedir.**

This chapter includes 120 test questions with solutions and 84 test questions.

**BÖLÜM / CHAPTER 5**

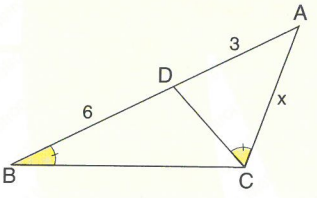
**ÜÇGENLERDE BENZERLİK VE ALAN / SIMILARITY and AREA in TRIANGLES**

**1.** $m(\widehat{AED}) = m(\widehat{ABC})$
$|AD| = 8$ cm,
$|DE| = 6$ cm,
$|BC| = 12$ cm
$\Rightarrow$ **$|AC| = ?$ cm**



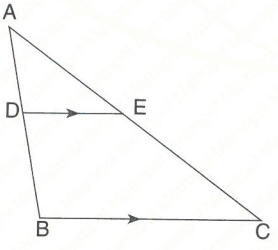

A) 8 B) 10 C) 12 D) 14 E) 16

**2.** $m(\widehat{ABC}) = m(\widehat{ACD})$,
$|BD| = 6$ cm,
$|DA| = 3$ cm
$\Rightarrow$ **$|AC| = x = ?$ cm**



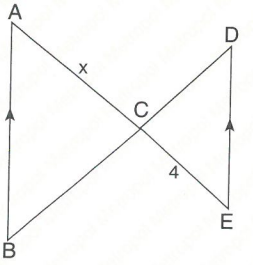

A) $2\sqrt{6}$ B) $3\sqrt{3}$ C) $4\sqrt{2}$ D) $\sqrt{33}$ E) 6

**3.** [DE] // [BC],
$\frac{|AE|}{|EC|} = \frac{2}{3}$
$\frac{A(\widehat{ADE})}{A(\widehat{DBCE})} = ?$



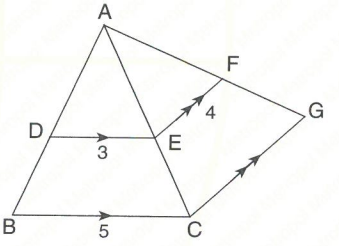

A) $\frac{4}{25}$ B) $\frac{2}{11}$ C) $\frac{4}{21}$ D) $\frac{4}{19}$ E) $\frac{1}{4}$

**4.** [AB] // [DE],
$\frac{|BC|}{2} = |CD|$,
$|CE| = 4$ cm
$\Rightarrow$ **$|CA| = x = ?$ cm**



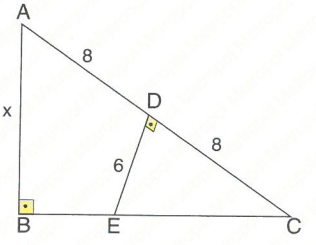

A) 5 B) 6 C) 7 D) 8 E) 9

**5.** [DE] // [BC],
[EF] // [CG],
$|DE| = 3$ cm,
$|BC| = 5$ cm,
$|EF| = 4$ cm
$\Rightarrow$ **$|CG| = ?$ cm**




A) 4 B) 5 C) $\frac{20}{3}$ D) 7 E) $\frac{22}{3}$

**6.** [AB] $\perp$ [BC],
[AC] $\perp$ [DE]
$|DC| = |DA| = 8$ cm,
$|DE| = 6$ cm
$\Rightarrow$ **$|AB| = x = ?$ cm**




A) 9,6 B) 9,8 C) 10 D) 10,4 E) 12

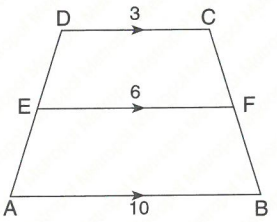
**7.** [DC] // [EF] // [AB],

|DC| = 3 cm

|EF| = 6 cm,

|AB| = 10 cm

$\Rightarrow \dfrac{|CF|}{|FB|} = ?$




A) $\frac{1}{12}$ B) $\frac{2}{3}$ C) $\frac{3}{4}$ D) $\frac{4}{5}$ E) $\frac{7}{10}$

**8.** G noktası ağırlık merkezidir.

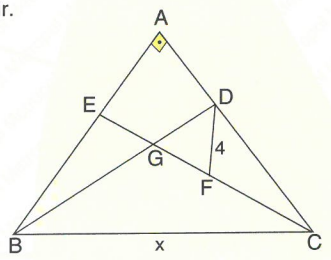
G is center of the gravity.

|BA| ⊥ [AC]

|GF| = |FC|,

|DF| = 4 cm

$\Rightarrow$ **|BC| = x = ? cm**



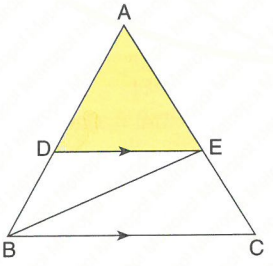

A) 16 B) 20 C) 22 D) 24 E) 26

**9.** |AE| = 3·|EC|,

[DE] // [BC],

$A(\widehat{DBE}) = 4\ cm^2$

$\Rightarrow$ **$A(\widehat{ADE}) = ?\ cm^2$**




A) 10 B) 12 C) 15 D) 18 E) 20

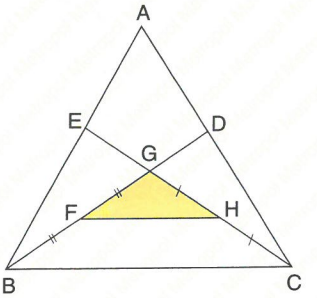
**10.** G noktası ağırlık merkezidir.

G is center of the gravity.

|GF|=|FB|

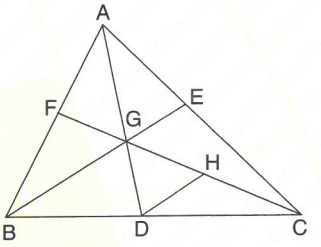
|GH| = |HC|

$\dfrac{A(\widehat{GFH})}{A(\widehat{ABC})} = ?$




A) $\frac{1}{12}$ B) $\frac{1}{15}$ C) $\frac{1}{16}$ D) $\frac{1}{18}$ E) $\frac{1}{24}$

**11.**




G noktası ağırlık merkezidir. / G is center of the gravity.

[BE] // [DH], |AD| + |BE| + |CF| = 48 cm

$\Rightarrow$ **Çevre / The perimeter $(\widehat{GHD})$ = ? cm**

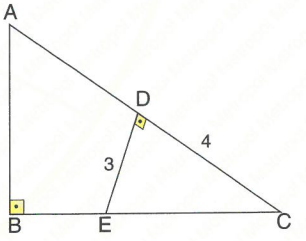
A) 16 B) 18 C) 21 D) 24 E) 27

**12.** $A(\widehat{ABED}) = A(\widehat{DEC})$,

|ED| = 3 cm,

|DC| = 4 cm

$\Rightarrow$ **|AD| = ? cm**




A) $4\sqrt{2} - 3$ B) $4\sqrt{2} - 4$ C) $5\sqrt{2} - 2$ D) $5\sqrt{2} - 3$ E) $5\sqrt{2} - 4$

**YANITLAR / ANSWERS**

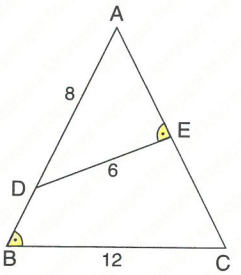
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | B | C | D | C | A | C | D | B | A | A | E |

**1.** ADE ~ ABC

$\frac{|DE|}{|BC|} = \frac{|AD|}{|AC|}$

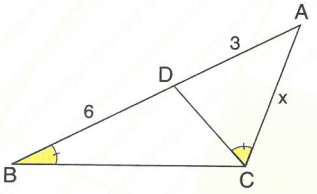
$\frac{6}{12} = \frac{8}{|AC|}$

$|AC| = 16$ cm




Yanıt / Answer **E**

**2.**



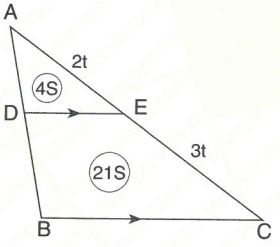

$\widehat{ADE} \sim \widehat{ABC}$

$\frac{|AD|}{|AC|} = \frac{|AC|}{|AB|} \Rightarrow \frac{3}{x} = \frac{x}{9}$

$x^2 = 27 \Rightarrow x = 3\sqrt{3}$ cm

Yanıt / Answer **B**

**3.**




$\widehat{ADE} \sim \widehat{ABC} \Rightarrow$

Benzerlik oranı / the similarity ratio $= \frac{2}{5}$

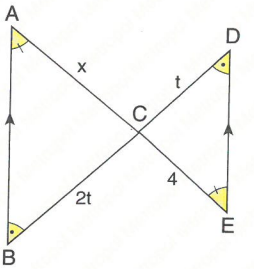
$\frac{A(\widehat{ADE})}{A(ABC)} = \left(\frac{2}{5}\right)^2 = \frac{4}{25}$

$A(\widehat{ADE}) = 4 \cdot S \Rightarrow A(\widehat{ABC}) = 25 \cdot S \Rightarrow A(DBCE) = 21 \cdot S$

$\frac{A(\widehat{ADE})}{A(DEBC)} = \frac{4}{21}$

Yanıt / Answer **C**

**4.**

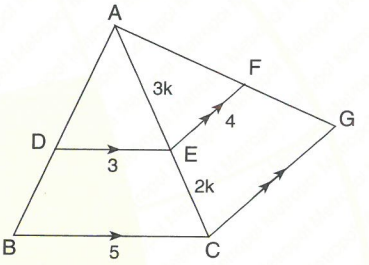



$\widehat{ABC} \sim \widehat{CDE}$

$\frac{|AC|}{|CE|} = \frac{|CB|}{|CD|} \Rightarrow \frac{x}{4} = \frac{2t}{t} \Rightarrow x = 8$ cm

Yanıt / Answer **D**

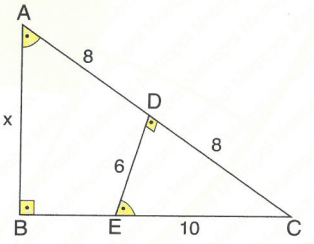
**5.**




$\left.\begin{array}{l} DE \parallel BC \Rightarrow \frac{|AE|}{|AC|} = \frac{3}{5} \\ EF \parallel CG \Rightarrow \frac{|AE|}{|AC|} = \frac{|EF|}{|CG|} \end{array}\right\} \Rightarrow \frac{3}{5} = \frac{4}{|CG|} \Rightarrow |CG| = \frac{20}{3}$ cm

Yanıt / Answer **C**

**6.**




$m(\widehat{A}) = 90° \Rightarrow |EC|^2 = |DE|^2 + |DC|^2$ [Pythagor]

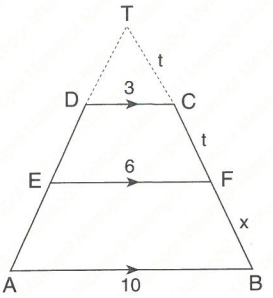
$|EC|^2 = 6^2 + 8^2 \Rightarrow |EC| = 10$ cm

$\widehat{DCE} \sim \widehat{ABC}$

$\frac{|DE|}{|AB|} = \frac{|EC|}{|AC|} \Rightarrow \frac{6}{x} = \frac{10}{16} \Rightarrow x = 9{,}6$ cm

Yanıt / Answer **A**

**7.**



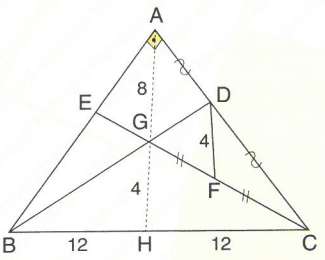

$\widehat{TDC} \sim \widehat{TAB} \Rightarrow$

$\frac{t}{2t+x} = \frac{3}{10} \Rightarrow 10t = 6t + 3x$

$4t = 3x \Rightarrow \frac{t}{x} = \frac{3}{4}$

**Yanıt / Answer C**

**8.**




$\widehat{CFD} \sim \widehat{CGA} \Rightarrow$

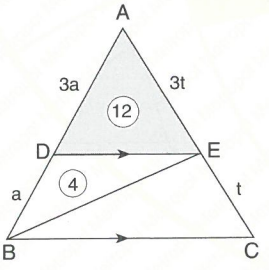
$\frac{|AG|}{|DF|} = \frac{|FC|}{|GC|} \Rightarrow |AG| = 2 \cdot |DF|$

$|AG| = 2.4 = 8$ cm $\Rightarrow |AH| = 12$ cm

$|BC| = 2 \cdot |AH| = 2 \cdot 12 = 24$ cm

**Yanıt / Answer D**

**9.**

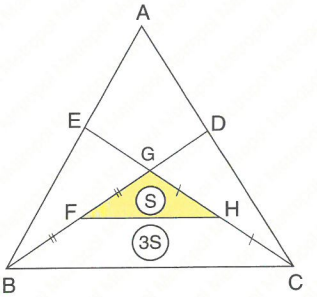



$\frac{|AE|}{|AC|} = \frac{|AD|}{|AB|} \Rightarrow \frac{|AD|}{|AB|} = \frac{3}{4}$

$\frac{A(\widehat{ADE})}{A(\widehat{DBE})} = \frac{3}{1} = 3 \Rightarrow A(\widehat{ADE}) = 12 \text{ cm}^2$

**Yanıt / Answer B**

**10.**




$\widehat{GFH} \sim \widehat{GBC} \Rightarrow$

Benzirlik oranı / the similarity ratio $= \frac{2}{5}$

$\frac{A(\widehat{GFH})}{A(\widehat{GBC})} = \left(\frac{1}{2}\right)^2 \Rightarrow A(\widehat{GFH}) = S \Rightarrow A(\widehat{GBC}) = 4 \cdot S$

$A(\widehat{ABC}) = 3.A(\widehat{GBC}) \Rightarrow A(\widehat{ABC}) = 12 \cdot S$

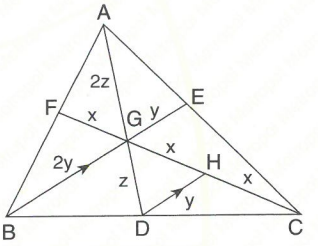
$\frac{A(\widehat{GFH})}{A(\widehat{ABC})} = \frac{S}{12S} = \frac{1}{12}$

**Yanıt / Answer A**

**11.** $3x + 3y + 3z = 48$

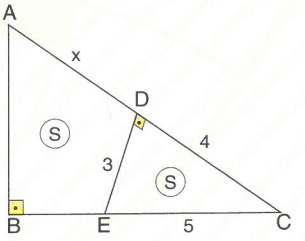
$x + y + z = 16$

$Ç(\widehat{DHG}) = 16$ cm




**Yanıt / Answer A**

**12.**




$\widehat{DEC} \sim \widehat{ABC} \Rightarrow$

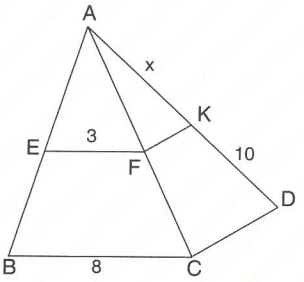
$k^2 = \frac{S}{2S} = \frac{1}{2}$

$k = \frac{1}{\sqrt{2}}$ [benzerlik oranı / the similarty ratio]

$\frac{5}{x+4} = k \Rightarrow \frac{5}{x+4} = \frac{1}{\sqrt{2}} \Rightarrow x = 5\sqrt{2} - 4$ cm

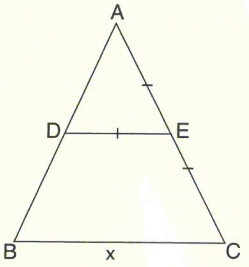
**Yanıt / Answer E**

**1.** [EF] // [BC],
[FK] // [CD],
|EF| = 3 cm,
|BC| = 8 cm,
|KD| = 10 cm
⇒ **|AK| = x = ? cm**



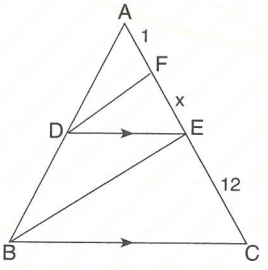

A) 6 B) 8 C) 10 D) 12 E) 14

**2.** [DE] // [BC],
|DE| = |EC| = |EA|,
|AD| = 6 cm,
|AB| + |BC| + |AC| = 32 cm
⇒ **|BC| = x = ? cm**



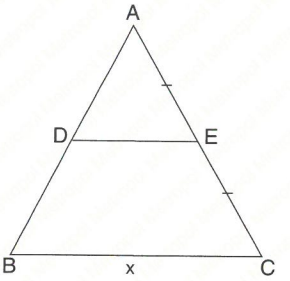

A) 9 B) 10 C) 11 D) 12 E) 13

**3.** [DF] // [BE],
[DE] // [BC],
|AF| = 1 cm,
|EC| = 12 cm.
⇒ **|EF| = x = ? cm**



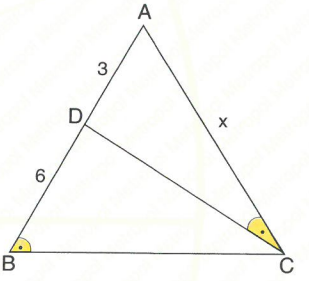

A) 2 B) 3 C) 4 D) 5 E) 6

**4.** [DE] // [BC],
|AE| = |EC|,
|BC| = 3a – 5 cm,
|DE| = a + 4 cm.
⇒ **|BC| = x = ? cm**



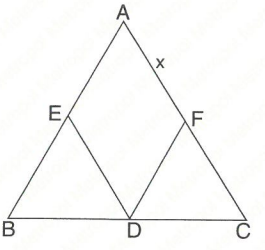

A) 48 B) 40 C) 32 D) 34 E) 20

**5.** $m(\widehat{ABC}) = m(\widehat{DCA})$,
|BD| = 6 cm,
|AD| = 3 cm
⇒ **|AC| = x = ? cm**



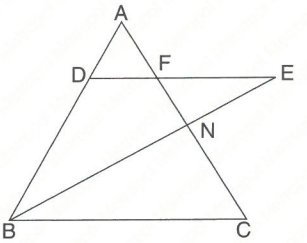

A) $3\sqrt{3}$ B) $4\sqrt{3}$ C) $5\sqrt{2}$ D) 6 E) 4

**6.** |AE| = |FD| = |AF| = |ED|,
|AB| = 4 cm,
|AC| = 8 cm.
⇒ **|AF| = x = ? cm**



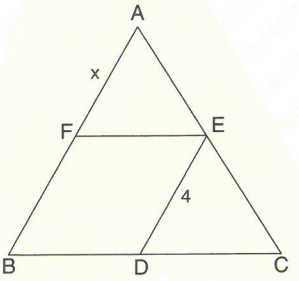

A) $\frac{7}{2}$ B) $\frac{8}{3}$ C) $\frac{10}{3}$ D) $\frac{13}{2}$ E) $\frac{14}{3}$

**7.** [DE] // [BC],
|FC| = 2|AF|,
|DF| = |FE|,
|FN| = 2 cm
⇒ **|AC| = x = ? cm**



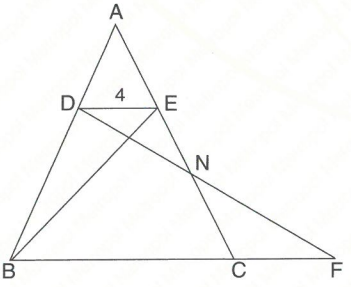

A) 9 B) 12 C) 14 D) 16 E) 18

**8.** [FE] // [BD],
[FB] // [ED],
|ED| = 4 cm,
$\frac{|BD|}{|BC|} = \frac{3}{4}$
⇒ **|AF| = x = ? cm**




A) 9 B) 10 C) 12 D) 16 E) 18

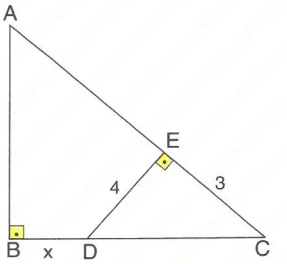
**9.**




[DE] // [BF], |DE| = 4 cm, |AE| = |NC| = 2|EN|
⇒ **|BF| = ? cm**

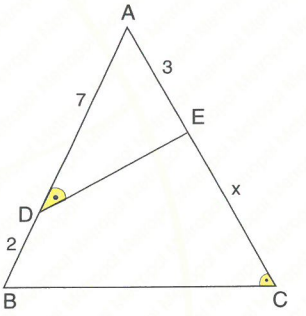
A) 10 B) 12 C) 14 D) 16 E) 18

**10.** [AB] ⊥ [BC],
[DE] ⊥ [AC],
|AB| = 12 cm,
|DE| = 4 cm,
|EC| = 3 cm
⇒ **|BD| = x = ? cm**



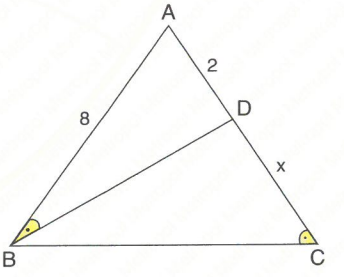

A) 3 B) 4 C) 5 D) 6 E) 7

**11.** m($\widehat{ADE}$) = m($\widehat{ACB}$),
|AD| = 7 cm,
|AE| = 3 cm,
|DB| = 2 cm.
⇒ **|EC| = x = ? cm**




A) 10 B) 12 C) 15 D) 18 E) 21

**12.** m($\widehat{ABD}$) = m($\widehat{ACB}$),
|AB| = 8 cm,
|AD| = 2 cm
⇒ **|DC| = x = ? cm**

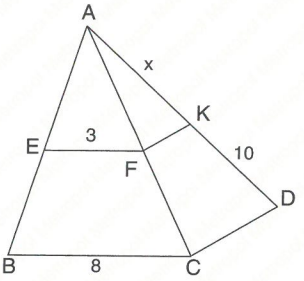



A) 14 B) 16 C) 18 D) 24 E) 30

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | B | D | A | B | B | C | E | B | D | E |

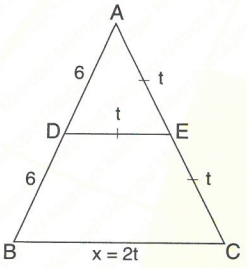
1.




$$\left.\begin{array}{l}\dfrac{|AF|}{|AC|}=\dfrac{|EF|}{|BC|}\\[2ex]\dfrac{|AF|}{|AC|}=\dfrac{|AK|}{|AD|}\end{array}\right\}\Rightarrow \frac{3}{8}=\frac{x}{x+10}\Rightarrow x=6\text{ cm}$$

Yanıt / Answer A

2.

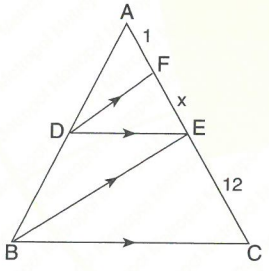



$12 + 2t + 2t = 32 \Rightarrow t = 5$ cm

$|BC| = 10$ cm

Yanıt / Answer B

3.




$\widehat{AFD} \sim \widehat{AEB} \Rightarrow \dfrac{|AD|}{|AB|}=\dfrac{|AF|}{|AE|}$

$\dfrac{|AD|}{|AB|}=\dfrac{1}{1+x}$

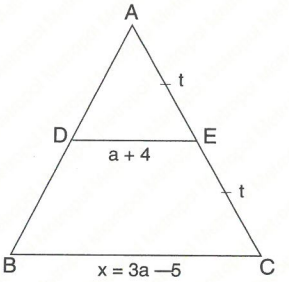
$\widehat{ADE} \sim \widehat{ABC} \Rightarrow \dfrac{|AD|}{|AB|}=\dfrac{|AE|}{|AC|}$

$\dfrac{|AD|}{|AB|}=\dfrac{1+x}{1+x+12}$

$\dfrac{1}{x+1}=\dfrac{x+1}{x+13}\Rightarrow x=3$ cm

Yanıt / Answer B

4.



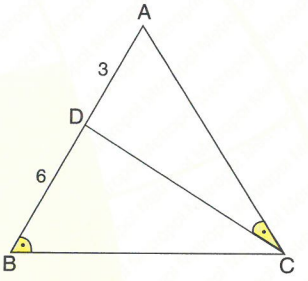

$$\left.\begin{array}{l}\widehat{ADE} \sim \widehat{ABC}\\[2ex]\dfrac{|AE|}{|AC|}=\dfrac{|DE|}{|BC|}\end{array}\right\}\Rightarrow$$

$\dfrac{1}{2}=\dfrac{a+4}{3a-5}\Rightarrow a=13$ cm

$x = 3a-5 \Rightarrow x = 34$ cm

Yanıt / Answer D

5.



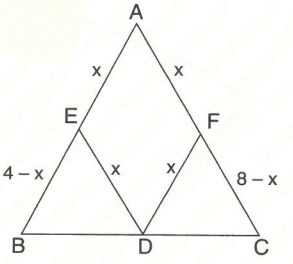

$\widehat{DCA} \sim \widehat{ABC} \Rightarrow$

$\dfrac{|AD|}{|AC|}=\dfrac{|AC|}{|AB|}$

$\dfrac{3}{x}=\dfrac{x}{9}\Rightarrow x^2=27\Rightarrow x=3\sqrt{3}$ cm

Yanıt / Answer A

6.

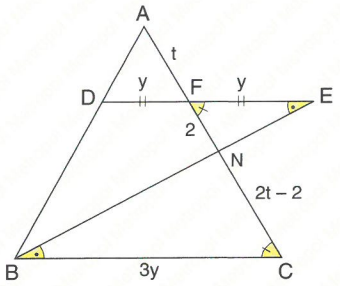



$\widehat{ABC} \sim \widehat{FDC} \Rightarrow \dfrac{|FC|}{|AC|}=\dfrac{|FD|}{|AB|}$

$\dfrac{8-x}{8}=\dfrac{x}{4}\Rightarrow x=\dfrac{8}{3}$ cm

Yanıt / Answer B

**7.**




$|DF| = |FE| = y \Rightarrow |BC| = 3y$

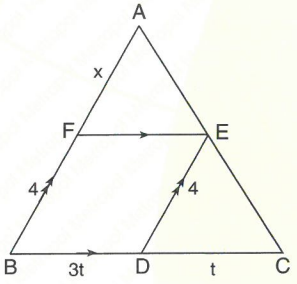
$\widehat{FEN} \sim \widehat{BNC}$

$\frac{|FE|}{|BC|} = \frac{|FN|}{|NC|} \Rightarrow \frac{y}{3y} = \frac{2}{2t-2} \Rightarrow t = 4$ cm

$|AC| = t + 2 + 2t - 2 = 12$ cm

**Yanıt / Answer B**

**8.**

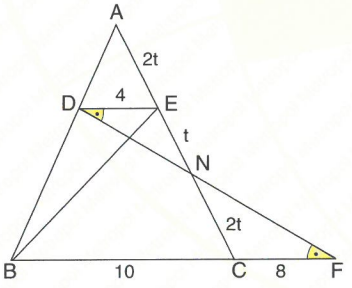



$\widehat{EDC} \sim \widehat{ABC}$

$\frac{|ED|}{|AB|} = \frac{|DC|}{|BC|} \Rightarrow \frac{4}{4+x} = \frac{t}{4t} \Rightarrow x = 12$ cm

**Yanıt / Answer C**

**9.**




$\widehat{ADE} \sim \widehat{ABC} \Rightarrow$

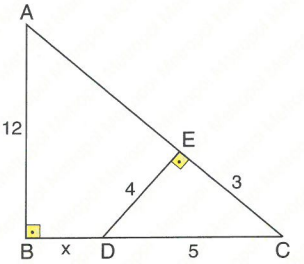
$\frac{|AE|}{|AC|} = \frac{|DE|}{|BC|} \Rightarrow \frac{2t}{5t} = \frac{4}{|BC|} \Rightarrow |BC| = 10$ cm

$\widehat{DEN} \sim \widehat{NCF} \Rightarrow$

$\frac{4}{|CF|} = \frac{t}{2t} \Rightarrow |CF| = 8$ cm $\Rightarrow |BF| = 10 + 8 = 18$ cm

**Yanıt / Answer E**

**10.**

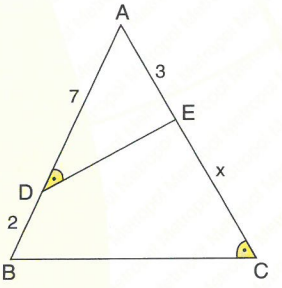



$\widehat{ABC} \sim \widehat{EDC} \Rightarrow$

$\frac{|BC|}{|EC|} = \frac{|AB|}{|ED|} \Rightarrow \frac{x+5}{3} = \frac{12}{4} \Rightarrow x = 4$ cm

**Yanıt / Answer B**

**11.**

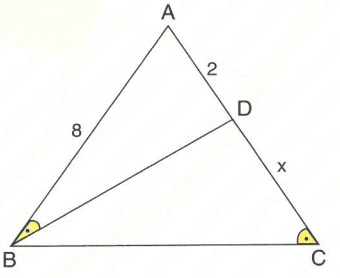



$\widehat{ADE} \sim \widehat{ABC} \Rightarrow$

$\frac{|AE|}{|AB|} = \frac{|AD|}{|AC|} \Rightarrow \frac{3}{9} = \frac{7}{x+3} \Rightarrow x = 18$ cm

**Yanıt / Answer D**

**12.**

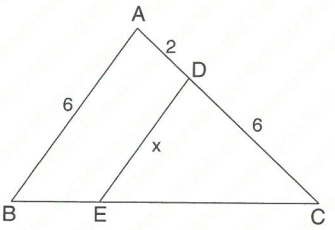



$\widehat{ADB} \sim \widehat{ABC} \Rightarrow$

$\frac{|AD|}{|AB|} = \frac{|AB|}{|AC|} \Rightarrow \frac{2}{8} = \frac{8}{x+2} \Rightarrow x = 30$ cm

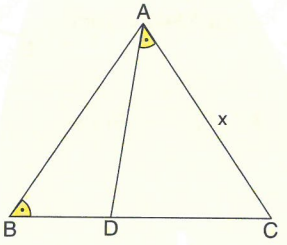
**Yanıt / Answer E**

**1.** [AB] // [DE],
|AB| = 6 cm,
|DC| = 6 cm,
|AD| = 2 cm
⇒ **|DE| = ? cm**



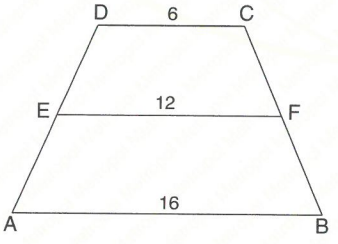

A) 4 B) 4,5 C) 5 D) 5,2 E) 5,5

**2.** $m(\widehat{DAC}) = m(\widehat{ABC})$,
|CB| = 18 cm,
|CD| = 8 cm
⇒ **|CA| = x = ? cm**



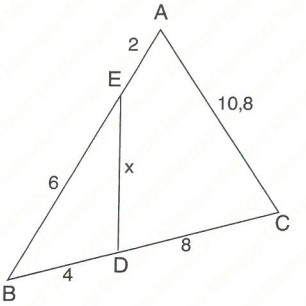

A) 9 B) 10 C) 12 D) 12,4 E) 14

**3.** [DC] // [EF] // [AB],
[DC] = 6 cm,
|EF| = 12 cm,
|AB| = 16 cm
⇒ $\frac{|CF|}{|CB|}$ **= ?**



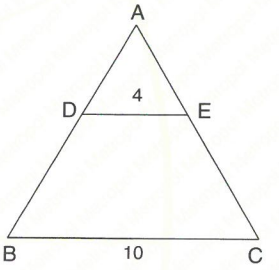

A) $\frac{7}{20}$ B) $\frac{2}{5}$ C) $\frac{1}{2}$ D) $\frac{3}{5}$ E) $\frac{4}{5}$

**4.** |BE| = 6 cm,
|BD| = 4 cm,
|EA| = 2 cm,
|DC| = 8 cm,
|AC| = 10,8 cm
⇒ **|ED| = x = ? cm**



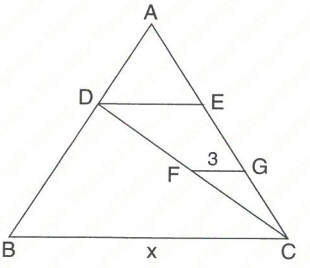

A) 5,4 B) 6 C) 7,2 D) 7,8 E) 8,1

**5.** [DE] // [BC],
|DE| = 4 cm,
|BC| = 10 cm,
|BD|+|CE| = 15 cm
⇒ **|AD| + |AE| = ? cm**



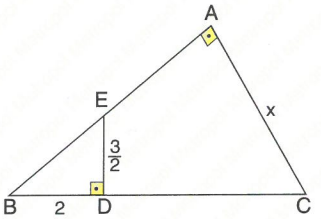

A) 6 B) 8 C) 9 D) 10 E) 12

**6.** [DE] // [FG] // [BC],
$\frac{|AE|}{5} = \frac{|EG|}{4} = \frac{|GC|}{3}$,
|FG| = 3 cm
⇒ **|BC| = ? cm**



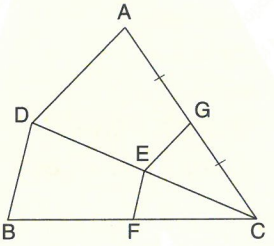

A) 10 B) $\frac{21}{2}$ C) 12 D) 14 E) $\frac{84}{5}$

**7.** [BA] ⊥ [AC],
[ED] ⊥ [CB]
|AB| + |BC| + |AC| =18 cm,
$|ED| = \frac{3}{2}$ cm,
|BD| = 2 cm,
⇒ **|AC| = x cm**



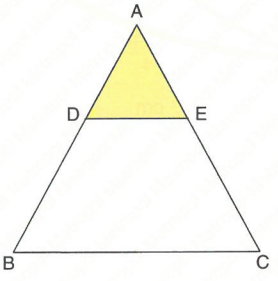

A) $\frac{9}{2}$ B) $\frac{24}{5}$ C) 5 D) $\frac{27}{5}$ E) 6

**8.** [GE] // [AD],
[EF] // [DB]
|AG| = |GC|
⇒ $\frac{|BF|}{|BC|}$ **= ?**



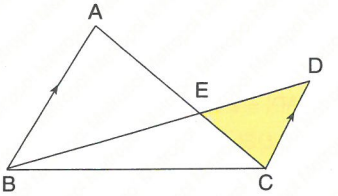

A) $\frac{1}{2}$ B) $\frac{3}{5}$ C) $\frac{5}{8}$ D) $\frac{3}{4}$ E) $\frac{7}{8}$

**9.** [DE] // [BC],
4.|AD| = 3.|DB|,
A(BCED) = 80 cm$^2$
⇒ **A($\widehat{ADE}$) = ? cm$^2$**



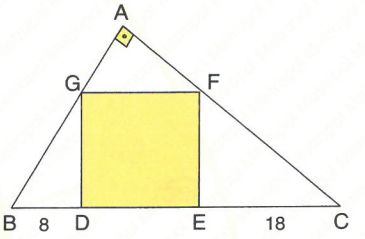

A) 16 B) 18 C) 20 D) 22 E) 24

**10.** [AB] // [DC],
|BE| = 4|ED|
⇒ $\frac{A(\widehat{ABC})}{A(\widehat{ECD})}$ **= ?**



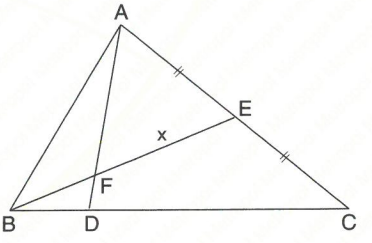

A) 18 B) 20 C) 22 D) 24 E) 26

**11.** DEFG bir karedir.
DEFG is a square.
[AB] ⊥ [AC],
|BD| = 8 cm,
|EC| = 18 cm
⇒ **A(DEFG) = ? cm$^2$**




A) 100 B) 121 C) 144 D) 169 E) 196

**12.** |AE| = |EC|,
|DC| = 3·|BD|,
|BE| = 15 cm
⇒ **|EF| = x = ? cm**

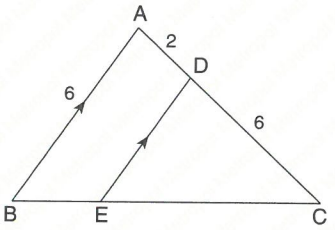



A) 8 B) $\frac{17}{5}$ C) 9 D) $\frac{19}{2}$ E) 4

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | C | D | A | D | E | A | A | B | B | C | C |

**1.**

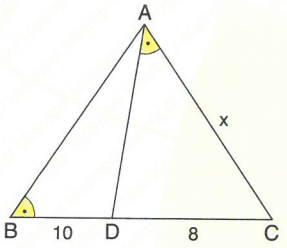



$\widehat{ABC} \sim \widehat{DEC} \Rightarrow \frac{|DC|}{|CA|} = \frac{|DE|}{|AB|}$

$\frac{6}{8} = \frac{|DE|}{6} \Rightarrow |DE| = 4,5$ cm

**Yanıt / Answer B**

**2.**

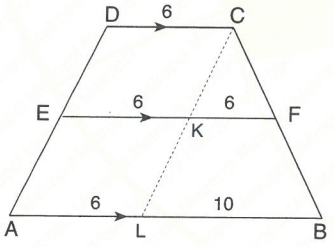



$\widehat{ADC} \sim \widehat{BAC} \Rightarrow \frac{|DC|}{|AC|} = \frac{|AC|}{|BC|}$

$\frac{8}{x} = \frac{x}{18} \Rightarrow x^2 = 8 \cdot 18 \Rightarrow x = 12$ cm

**Yanıt / Answer C**

**3.**




CL // DA $\Rightarrow$ $|DC| = |EK| = |AL| = 6$ cm

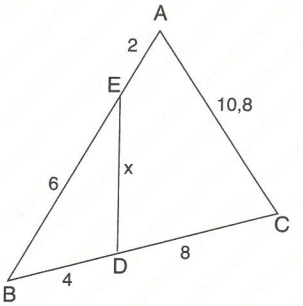
$\widehat{CKF} \sim \widehat{CLB}$

$\frac{|CF|}{|CB|} = \frac{|KF|}{|LB|} = \frac{6}{10}$

$\frac{|CF|}{|CB|} = \frac{3}{5}$

**Yanıt / Answer D**

**4.**




$\frac{|BD|}{|AB|} = \frac{|BE|}{|BC|} = \frac{1}{2} \Rightarrow \widehat{BDE} \sim \widehat{BAC} \Rightarrow$

Benzirlik oranı / the similarity ratio $= \frac{1}{2}$

$\frac{x}{10,8} = \frac{1}{2} \Rightarrow 5,4$ cm

**Yanıt / Answer A**

**5.**

DE // BC $\Rightarrow$

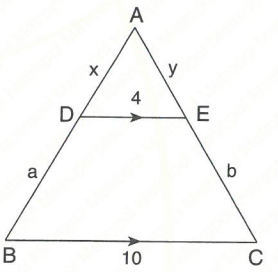
$\frac{|AD|}{|AB|} = \frac{|AE|}{|AC|} = \frac{|DE|}{|BC|}$

$\frac{x}{x+a} = \frac{y}{y+b} = \frac{4}{10}$

$\frac{x+y}{x+a+y+b} = \frac{4}{10}$

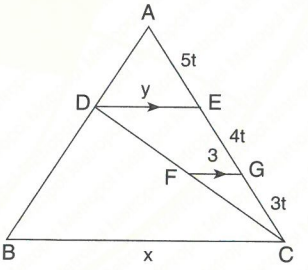
$\frac{x+y}{x+y+15} = \frac{4}{10}$

$x + y = 10$ cm




**Yanıt / Answer D**

**6.**




FG // DE $\Rightarrow \frac{|GC|}{|EC|} = \frac{|FG|}{|DE|}$

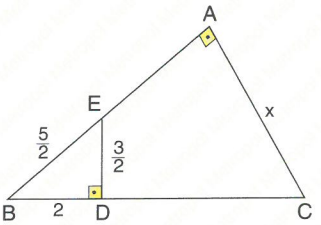
$\frac{3t}{7t} = \frac{3}{y} \Rightarrow y = 7$ cm

DE // BC $\Rightarrow \frac{|AE|}{|AC|} = \frac{|DE|}{|BC|}$

$\frac{5t}{12t} = \frac{y}{x} \Rightarrow \frac{5}{12} = \frac{7}{x} \Rightarrow x = \frac{84}{5}$ cm

**Yanıt / Answer E**

**7.**




$\widehat{BDE} \sim \widehat{ABC} \Rightarrow k = \dfrac{\frac{3}{2}}{x} = \dfrac{3}{2x}$ [Benzerlik oranı / the similarity ratio]

$\perp \widehat{BED} \Rightarrow 2^2 + \left(\dfrac{3}{2}\right)^2 = |BE|^2$ [Pisagor / Pythagor]

$|BE| = \dfrac{5}{2}$ cm

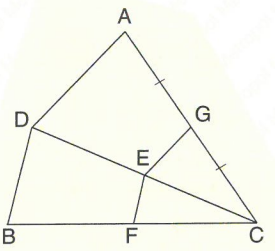
$\dfrac{Ç(\widehat{BED})}{Ç(\widehat{ABC})} = \dfrac{3}{2x} \Rightarrow \dfrac{Ç(\widehat{BCD})}{18} = \dfrac{3}{2x}$

$\dfrac{6}{18} = \dfrac{3}{2x} \Rightarrow x = \dfrac{9}{2}$

**Yanıt / Answer A**

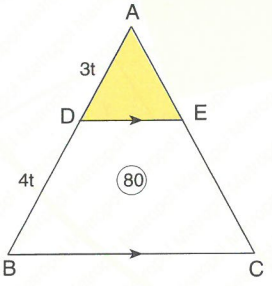
**8.** $|AG| = |GC| \Rightarrow |DE| = |EC|$

$|BF| = |FC| \Rightarrow \dfrac{|BF|}{|BC|} = \dfrac{1}{2}$




**Yanıt / Answer A**

**9.**




$\widehat{ADE} \sim \widehat{ABC} \Rightarrow k = \dfrac{3}{7}$ [Benzerlik oranı / the similarity ratio]

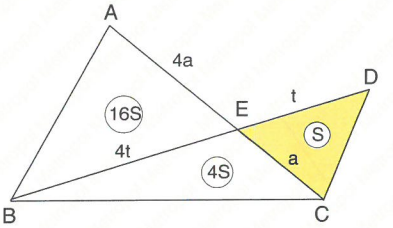
$\dfrac{A(\widehat{ADE})}{A(\widehat{ABC})} = \left(\dfrac{3}{7}\right)^2 = \dfrac{9}{49}$

$\dfrac{A(\widehat{ADE})}{A(BCED)} = \dfrac{9}{49-9} = \dfrac{9}{40} = \dfrac{A(\widehat{ADE})}{80}$

$A(\widehat{ADE}) = 18 \text{ cm}^2$

**Yanıt / Answer B**

**10.**

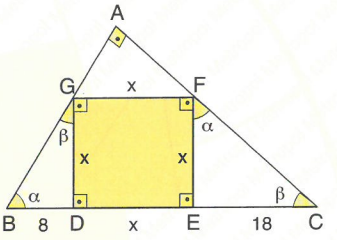



$\widehat{ABE} \sim \widehat{EDC} \Rightarrow k = 4$ [Benzerlik oranı / the similarity ratio]

$\dfrac{A(\widehat{ABE})}{A(\widehat{EDC})} = 4^2 = 16 \Rightarrow \dfrac{A(\widehat{ABC})}{A(\widehat{ECD})} = 20$

**Yanıt / Answer B**

**11.**



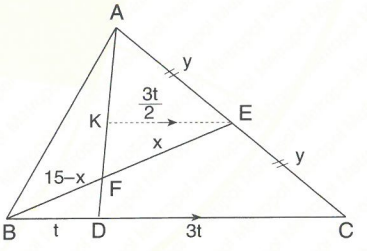

$\widehat{BDG} \sim \widehat{ECF} \Rightarrow$

$\dfrac{x}{18} = \dfrac{8}{x} \Rightarrow x^2 = 18 \cdot 8 \Rightarrow x = 12$ cm

$A(DEFG) = 12^2 = 144$ cm

**Yanıt / Answer C**

**12.**




$[EK] \parallel [BC] \Rightarrow \dfrac{|AE|}{|AC|} = \dfrac{|KE|}{|DC|} = \dfrac{1}{2}$

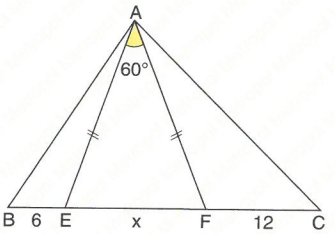
$\widehat{FBD} \sim \widehat{FEK} \Rightarrow$

$\dfrac{t}{\frac{3t}{2}} = \dfrac{15-x}{x}$

$2x = 45-3x \Rightarrow 5x = 45 \Rightarrow x = 9$ cm

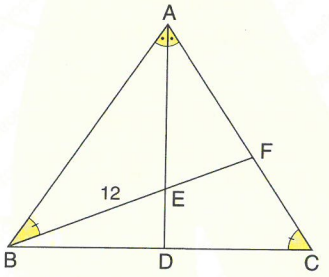
**Yanıt / Answer C**

**1.** $m(\widehat{BAC}) = 120°$,
$m(\widehat{EAF}) = 60°$,
$|AE| = |AF|$,
$|FC| = 12$ cm,
$|BE| = 6$ cm
$\Rightarrow$ **$|FE| = x = ?$ cm**



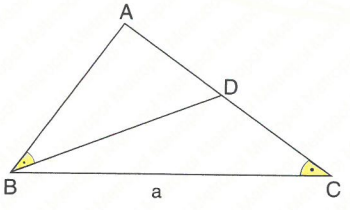

A) 8 B) $6\sqrt{2}$ C) $6\sqrt{3}$ D) 12 E) $12\sqrt{2}$

**2.** $m(\widehat{BAD}) = m(\widehat{DAC})$,
$m(\widehat{ABF}) = m(\widehat{ACB})$,
$[BF] \cap [AD] = \{E\}$,
$|AB| = 18$ cm,
$|AC| = 27$ cm,
$|BE| = 12$ cm.
$\Rightarrow$ **$|BC| = ?$ cm**



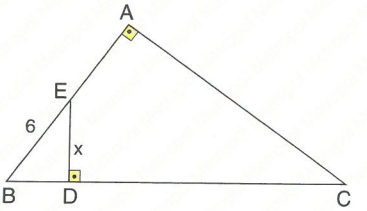

A) 27 B) 28 C) 30 D) 32 E) 36

**3.** $m(\widehat{ABD}) = m(\widehat{ACB})$,
$|AB| = 12$ cm,
$|BD| = 16$ cm,
$|AC| = 18$ cm
$\Rightarrow$ **$|BC| = a = ?$ cm**



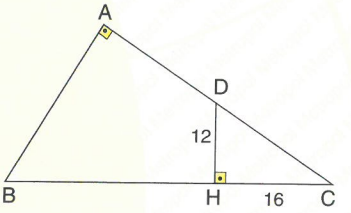

A) 24 B) 28 C) 30 D) 32 E) 36

**4.** $[BA] \perp [AC]$,
$[ED] \perp [BC]$,
$|AC| = 18$ cm,
$|BC| = 24$ cm,
$|EB| = 6$ cm
$\Rightarrow$ **$|ED| = x = ?$ cm**




A) 9 B) 8 C) 6 D) $\frac{9}{2}$ E) 4

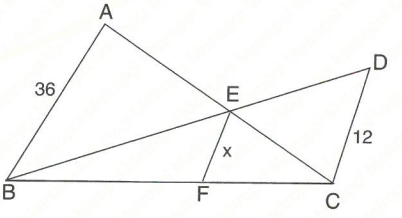
**5.**




$[BA] \perp [AC]$, $[DH] \perp [BC]$, $|AC| = 24$ cm,
$|DH| = 12$ cm, $|HC| = 16$ cm
$\Rightarrow$ **Çevre / The perimeter (ABHD) = ? cm**

A) 42 B) 48 C) 52 D) 58 E) 64

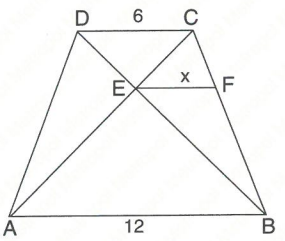
**6.**




$[AB] // [EF] // [CD]$, $[AC] \cap [BD] = \{E\}$,
$|AB| = 36$ cm, $|CD| = 12$ cm $\Rightarrow$ **$|EF| = x = ?$ cm**

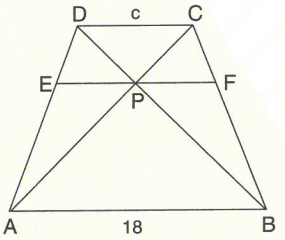
A) 3 B) 4 C) 6 D) 7,5 E) 9

**7.** [AB] // [DC] // [EF],
[AC] ∩ [DB] = {E},
|AB| = 12 cm,
|DC| = 6 cm
⇒ **|EF| = x = ? cm**



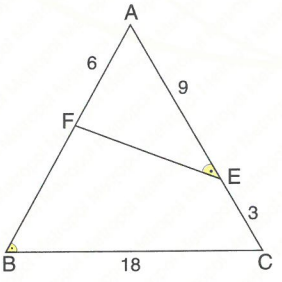

A) 5 B) 4,5 C) 4,2 D) 4 E) 3,6

**8.** [AB] // [EF] // [DC],
[AC] ∩ [BD] = {P},
|AB| = 18 cm,
|EF| = 12 cm
⇒ **|DC| = c = ? cm**



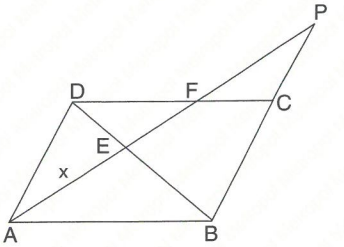

A) 8 B) 8,4 C) 8,6 D) 9 E) 9,6

**9.** m($\widehat{AEF}$) = m($\widehat{ABC}$),
|AF| = 6 cm,
|AE| = 9 cm,
|CE| = 3 cm,
|BC| = 18 cm
⇒ **Çevre(BCEF) = ? cm**
(Perimeter)



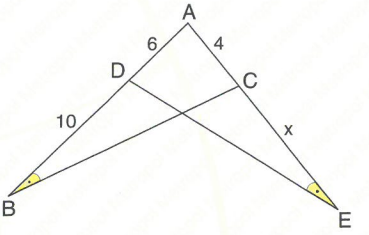

A) 36 B) 42 C) 45 D) 54 E) 60

**10.** [AB] // [DC],
[AD] // [BP],
|EP| = 18 cm,
|FP| = 10 cm
⇒ **|AE| = x = ? cm**



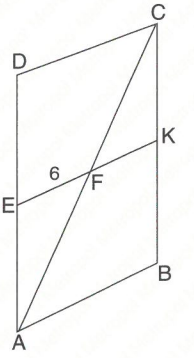

A) 6 B) 8 C) 9 D) 10 E) 12

**11.** m($\widehat{ABC}$) = m($\widehat{AED}$)
|AC| = 4 cm,
|AD| = 6 cm,
|DB| = 10 cm
⇒ **|CE| = x = ? cm**




A) 16 B) 18 C) 19 D) 20 E) 24

**12.** [EF] // [DC],
[FK] // [AB],
|AB| = 3|FK|,
|EF| = 6 cm
⇒ **|DC| = x = ? cm**

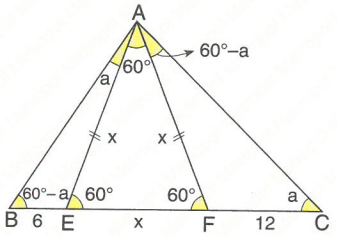



A) 8 B) 9 C) 10 D) 11 E) 12

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | C | A | D | B | E | D | D | B | E | D | B |

**1.**



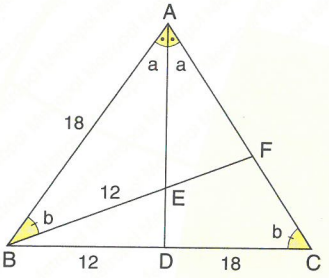

$\widehat{ABE} \sim \widehat{CAF} \Rightarrow$

$\frac{|AE|}{|FC|} = \frac{|BE|}{|AF|} \Rightarrow \frac{x}{12} = \frac{6}{x}$

$x^2 = 72 \Rightarrow x = 6\sqrt{2}$ cm

**Yanıt / Answer B**

**2.**




$\widehat{ABE} \sim \widehat{ACD}$

$\frac{12}{|DC|} = \frac{18}{27} \Rightarrow |DC| = 18$ cm

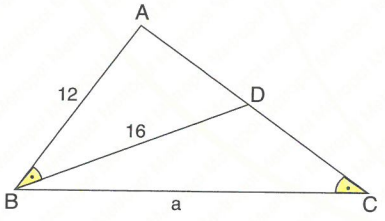
[AD] bir açıortaydır. / [AD] is a bisector.

$\frac{|AC|}{|AB|} = \frac{|DC|}{|BD|} \Rightarrow \frac{27}{18} = \frac{18}{|BD|} \Rightarrow$

$|BD| = 12$ cm $\Rightarrow |BC| = 18 + 12 = 30$ cm

**Yanıt / Answer C**

**3.**

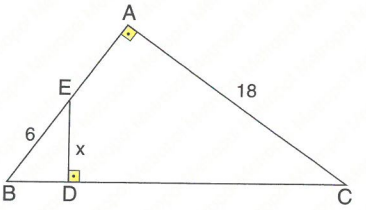



$\widehat{ADB} \sim \widehat{ABC} \Rightarrow$

$\frac{|BD|}{|BC|} = \frac{|AB|}{|AC|} \Rightarrow \frac{16}{a} = \frac{12}{18} \Rightarrow a = 24$ cm

**Yanıt / Answer A**

**4.**

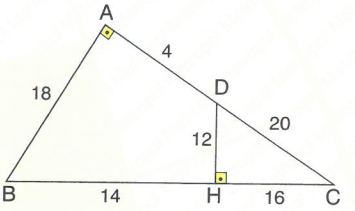



$\widehat{BDE} \sim \widehat{BAC} \Rightarrow$

$\frac{|ED|}{|AC|} = \frac{|EB|}{|BC|} \Rightarrow \frac{x}{18} = \frac{6}{24} \Rightarrow x = \frac{9}{2}$ cm

**Yanıt / Answer D**

**5.**




$|DC| = \sqrt{12^2 + 16^2} = 20$ [Pythagor]

$|AC| = 24$ cm $\Rightarrow |AD| = 4$ cm

$\widehat{ABC} \sim \widehat{HDC} \Rightarrow k = \frac{24}{16} = \frac{3}{2}$ [Benzerlik oranı / the similarity ratio]

$\frac{|AB|}{|DH|} = \frac{|AC|}{|HC|} = \frac{|BC|}{|DC|} = \frac{3}{2} \Rightarrow$

$|AB| = 12.\frac{3}{2} = 18$ cm

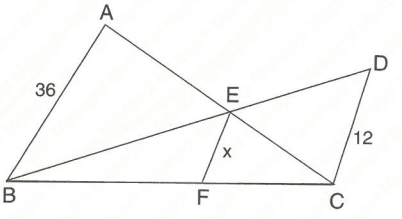
$|AC| = 16.\frac{3}{2} = 24$ cm

$|BC| = 20.\frac{3}{2} = 30$ cm

Çevre / The perimeter (ABHD) = 18 + 4 + 12 + 14 = 48 cm

**Yanıt / Answer B**

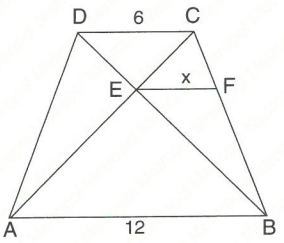
**6.**




$\frac{1}{36} + \frac{1}{12} = \frac{1}{x} \Rightarrow x = 9$ cm

**Yanıt / Answer E**

**7.**

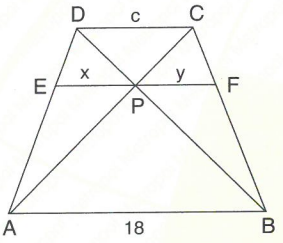



$$\frac{1}{|DC|}+\frac{1}{|AB|}=\frac{1}{|EF|}\Rightarrow$$

$$\frac{1}{6}+\frac{1}{12}=\frac{1}{x}\Rightarrow x=4\text{ cm}$$

**Yanıt / Answer D**

**8.**




$$x+y=12\text{ cm}$$

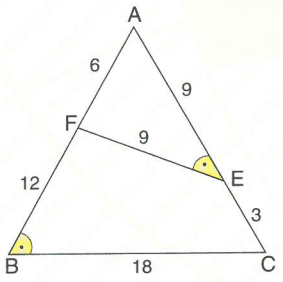
$$\begin{cases}\frac{1}{c}+\frac{1}{18}=\frac{1}{x}\Rightarrow\frac{x}{c}+\frac{x}{18}=1\\ \frac{1}{c}+\frac{1}{18}=\frac{1}{y}\Rightarrow\frac{y}{c}+\frac{y}{18}=1\end{cases}$$

$$\frac{x+y}{c}+\frac{x+y}{18}=2$$

$$\frac{12}{c}+\frac{12}{18}=2\Rightarrow c=9\text{ cm}$$

**Yanıt / Answer D**

**9.**



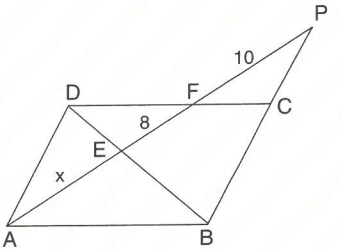

$$\widehat{AFE}\sim\widehat{ACB},\ \frac{|AF|}{|AC|}=\frac{|FE|}{|BC|}=\frac{|AE|}{|AB|}$$

$$\frac{6}{12}=\frac{|FE|}{18}=\frac{9}{|AB|}\Rightarrow\begin{cases}|FE|=9\text{ cm}\\|AB|=18\text{ cm}\\|FB|=12\text{ cm}\end{cases}$$

Çevre / Perimeter (BCEF) = 42 cm

**Yanıt / Answer B**

**10.**



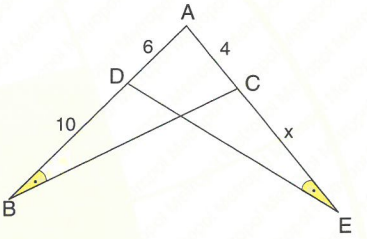

$$|AE|^2=|EF|\cdot|EP|$$

$$x^2=8\cdot18$$

$$x=12\text{ cm}$$

**Yanıt / Answer E**

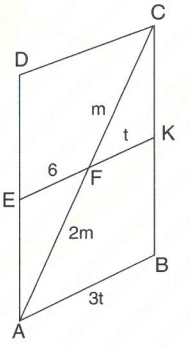
**11.**




$$\widehat{ABC}\sim\widehat{AED}\Rightarrow\frac{|AC|}{|AD|}=\frac{|AB|}{|AE|}\Rightarrow\frac{4}{6}=\frac{16}{4+x}\Rightarrow x=20\text{ cm}$$

**Yanıt / Answer D**

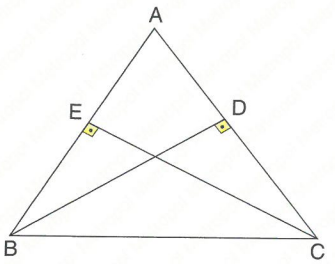
**12.**




$$\left.\begin{array}{l}FK\,//\,AB\Rightarrow\frac{|CF|}{|CA|}=\frac{m}{3m}\\ EF\,//\,DC\Rightarrow\frac{|AF|}{|AC|}=\frac{6}{|DC|}\end{array}\right\}\Rightarrow\frac{2m}{3m}=\frac{6}{|DC|}\Rightarrow|DC|=9\text{ cm}$$

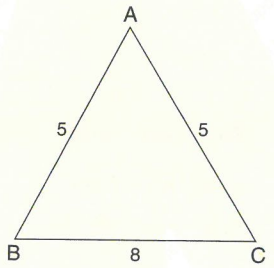
**Yanıt / Answer B**

**1.** $[BD] \perp [AC]$,
$[CE] \perp [AB]$,
$|BD| = 8$ cm,
$|AC| = 10$ cm,
$|EC| = 9$ cm
$\Rightarrow$ **$|AB| = ?$ cm**



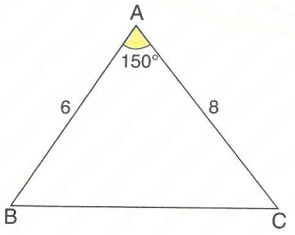

A) $\frac{25}{3}$ B) $\frac{26}{3}$ C) $\frac{79}{9}$ D) $\frac{80}{9}$ E) 9

**2.** $|AB| = |AC| = 5$ cm ,
$|BC| = 8$ cm
$\Rightarrow$ **$A(\widehat{ABC}) = ?$ cm$^2$**




A) 8 B) 9 C) 12 D) 15 E) 18

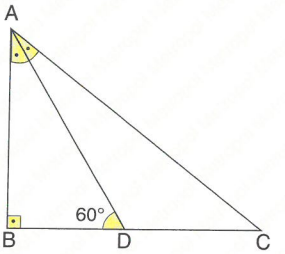
**3.** $|AB| = 6$ cm,
$|AC| = 8$ cm,
$m(\widehat{BAC}) = 150°$
$\Rightarrow$ **$A(\widehat{ABC}) = ?$ cm$^2$**




A) 10 B) 12 C) 15 D) 18 E) 24

**4.** $m(\widehat{BAD}) = m(\widehat{DAC})$,
$m(\widehat{BDA}) = 60°$,
$[AB] \perp [BC]$

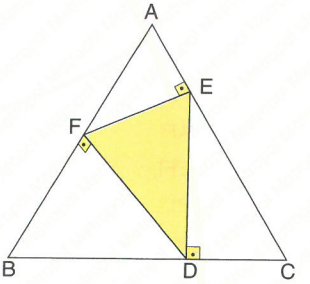
$\Rightarrow \dfrac{A(\widehat{ADC})}{A(\widehat{ABD})} = ?$




A) 2 B) $\frac{5}{2}$ C) 3 D) $\frac{7}{2}$ E) 4

**5.** $|AB| = |AC| = |BC|$,
$[FE] \perp [AC]$,
$[DF] \perp [AB]$,
$[ED] \perp [BC]$

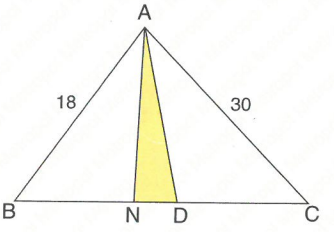
$\Rightarrow \dfrac{A(\widehat{ABC})}{A(\widehat{DEF})} = ?$




A) $\frac{3}{2}$ B) $\frac{9}{4}$ C) $\frac{5}{2}$ D) 3 E) $\frac{7}{2}$

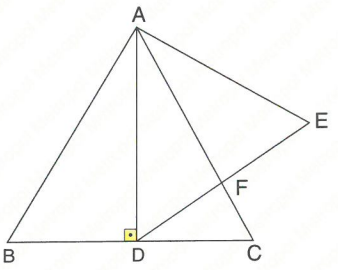
**6.** $m(\widehat{BAN}) = m(\widehat{NAC})$,
$|BD| = |DC|$,
$|AB| = 18$ cm,
$|AC| = 30$ cm

$\Rightarrow \dfrac{A(\widehat{ABN})}{A(\widehat{ADC})} = ?$



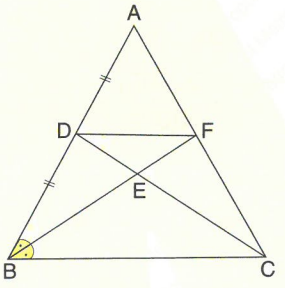

A) $\frac{3}{5}$ B) $\frac{13}{20}$ C) $\frac{7}{10}$ D) $\frac{3}{4}$ E) $\frac{5}{6}$

**7.** $|AB| = |AC| = |BC|$,
$|AD| = |AE| = |ED|$,
$[AD] \perp [BC]$,
$A(\widehat{ADE}) = 6\sqrt{3}$ cm$^2$
$\Rightarrow$ **$A(\widehat{ABC})$ = ? cm$^2$**



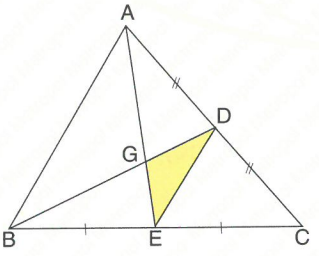

A) $4\sqrt{4}$ B) $6\sqrt{3}$ C) $8\sqrt{3}$ D) $12\sqrt{3}$ E) $16\sqrt{3}$

**8.** $(\widehat{ABF}) = (\widehat{FBC})$,
$|FC| = 2 \cdot |AF|$
$|BE| = 2 \cdot |EF|$,
$|AD| = |DB|$,
$A(\widehat{DEF}) = 2$ cm$^2$
$\Rightarrow$ **$A(\widehat{ABC})$ = ? cm$^2$**



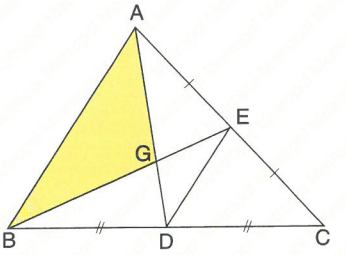

A) 30 B) 32 C) 35 D) 36 E) 40

**9.** $|BE| = |EC|$,
$|AD| = |DC|$,
$A(\widehat{GED}) = 5$ cm$^2$
$\Rightarrow$ **$A(\widehat{ABC})$ = ? cm$^2$**



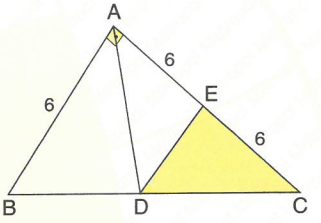

A) 45 B) 50 C) 55 D) 60 E) 70

**10.** $|BD| = |DC|$,
$|AE| = |EC|$,
$A(\widehat{GDE}) = 9$ cm$^2$
$\Rightarrow$ **$A(\widehat{ABG})$ = ? cm$^2$**




A) 18 B) 20 C) 24 D) 36 E) 48

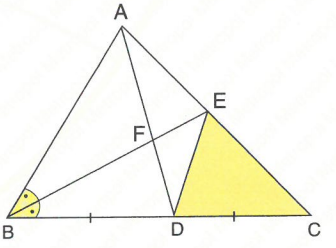
**11.**




$[BA] \perp [AC]$, $m(\widehat{BAD}) = 45°$, $|BA| = |AE| = |EC| = 6$ cm
$\Rightarrow$ **$A(\widehat{EDC})$ = ? cm$^2$**

A) 12 B) 14 C) 15 D) 18 E) 20

**12.** $|BD| = |DC|$,
$2 \cdot |AE| = 3 \cdot |EC|$,
$A(\widehat{DEF}) = 9$ cm$^2$
$\Rightarrow$ **$A(\widehat{EDC})$ = ? cm$^2$**

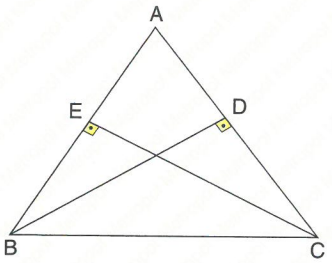



A) 18 B) 21 C) 24 D) 27 E) 30

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | C | B | A | D | D | C | D | D | D | A | C |

**1.**




$$A(\widehat{ABC}) = \frac{|BD| \cdot |AC|}{2} = \frac{|EC| \cdot |AB|}{2}$$

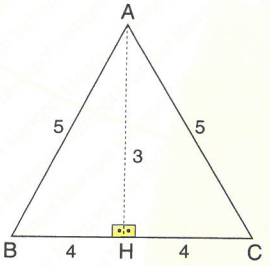
$$|BD| \cdot |AC| = |EC| \cdot |AB|$$

$$8 \cdot 10 = 9 \cdot |AB|$$

$$|AB| = \frac{80}{9} \text{ cm}$$

**Yanıt / Answer D**

**2.**




$$\left.\begin{array}{l} |AB| = |AC| \\ [AH] \perp [BC] \end{array}\right\} \Rightarrow |BH| = |HC| = 4 \text{ cm}$$

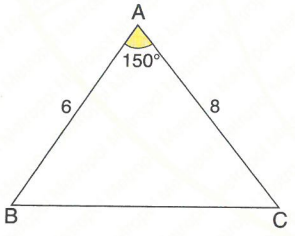
$5^2 = 4^2 + |AH|^2$ [ Pythagor ]

$|AH| = 3$ cm

$$A(\widehat{ABC}) = \frac{3 \cdot 8}{2} = 12 \text{ cm}^2$$

**Yanıt / Answer C**

**3.**

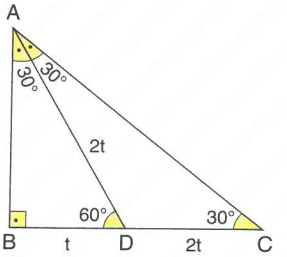



$$A(\widehat{ABC}) = \frac{1}{2} \cdot |AB| \cdot |AC| \cdot \sin 150^\circ \quad \left(\sin 150^\circ = \frac{1}{2}\right)$$

$$= \frac{1}{2} \cdot 6 \cdot 8 \cdot \frac{1}{2} = 12 \text{ cm}^2$$

**Yanıt / Answer B**

**4.**



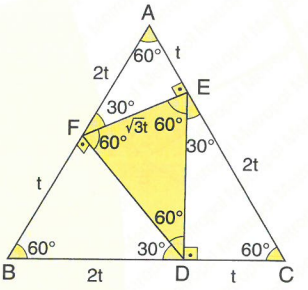

$m(\widehat{ADB}) = 60^\circ \Rightarrow m(\widehat{BAD}) = m(\widehat{DAC}) = m(\widehat{ACD}) = 30^\circ$

$\widehat{ABD}$ (30°, 60°, 90°) $\quad |BD| = t \Rightarrow |AD| = |DC| = 2t$

$$\frac{A(\widehat{ADC})}{A(\widehat{ABD})} = \frac{|DC|}{|BD|} = \frac{2t}{t} = 2$$

**Yanıt / Answer A**

**5.**




$|FE| = |ED| = |FD| = \sqrt{3}t$,

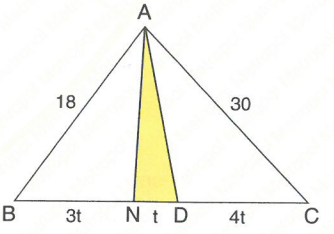
$|AB| = |AC| = |BC| = 3t$

$$\frac{A(\widehat{ABC})}{A(\widehat{DEF})} = \frac{\frac{\sqrt{3}.(3t)^2}{4}}{\frac{\sqrt{3}.(\sqrt{3}t)^2}{4}} = 3$$

**Yanıt / Answer D**

**6.** [AN] bir açıortaydır.

[AN] is a bisector.




$$\frac{|AC|}{|AB|} = \frac{|NC|}{|BN|}$$

$$\frac{30}{18} = \frac{|NC|}{|NB|}$$

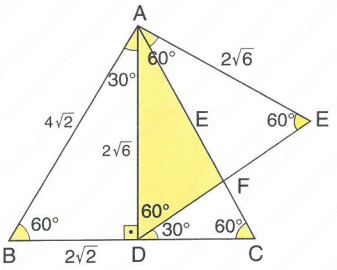
$|NB| = 3t \Rightarrow |NC| = 5t$

$|BD| = |DC| = 4t$

$$\frac{A(\widehat{ABN})}{A(\widehat{ADC})} = \frac{|BN|}{|DC|} = \frac{3t}{4t} = \frac{3}{4}$$

**Yanıt / Answer D**

**7.**



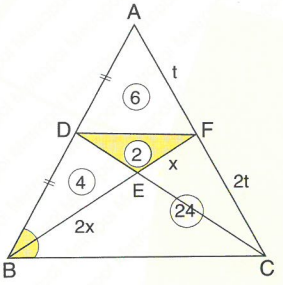

$A(\widehat{ADE}) = \dfrac{a^2\sqrt{3}}{4} = 6\sqrt{3} \Rightarrow a = 2\sqrt{6}$ cm

$|AD| = 2\sqrt{6}$ cm $\Rightarrow |AB| = 4\sqrt{2}$ cm

$A(\widehat{ABC}) = \dfrac{(4\sqrt{2})^2 \cdot \sqrt{3}}{4} = 8\sqrt{3}$ cm$^2$

**Yanıt / Answer C**

**8.**




$|BE| = 2\cdot|EF| \Rightarrow A(\widehat{BDE}) = 2\cdot A(\widehat{DEF}) = 4$ cm$^2$

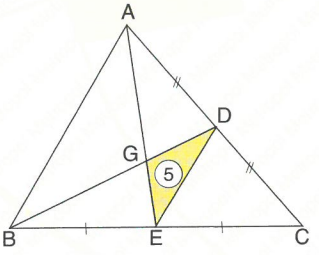
$|AD| = |DB| \Rightarrow A(\widehat{FDB}) = A(\widehat{ADF}) = 6$ cm$^2$

$2\cdot|AF| = |FC| \Rightarrow 2\cdot A(\widehat{ABF}) = A(\widehat{BFC}) = 24$ cm$^2$

$A(\widehat{ABC}) = 24 + 12 = 36$ cm$^2$

**Yanıt / Answer D**

**9.** G ağırlık merkezi,
[DE] orta tabandır.
G is center of the gravity,
[DE] is a middle base.

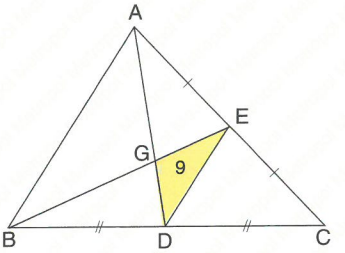



$\dfrac{A(\widehat{GDE})}{A(\widehat{ABC})} = \dfrac{1}{12}$

$A(\widehat{ABC}) = 60$ cm$^2$

**Yanıt / Answer D**

**10.**



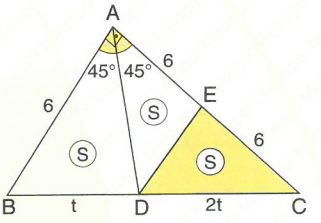

$9 = A(\widehat{GDE}) = \dfrac{1}{2}\cdot A(\widehat{ABC}) \Rightarrow A(\widehat{ABC}) = 108$ cm$^2$

$A(\widehat{ABG}) = \dfrac{1}{3}\cdot A(\widehat{ABC})$

$A(\widehat{ABG}) = 36$ cm$^2$

**Yanıt / Answer D**

**11.**




[AD] bir açıortaydır. / [AD] is a bisector.

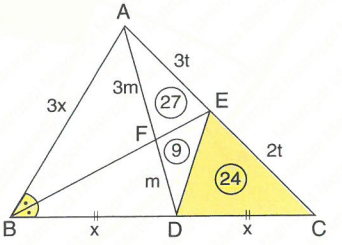
$\dfrac{|AC|}{|AB|} = \dfrac{|DC|}{|BD|} \Rightarrow \dfrac{|DC|}{|BD|} = \dfrac{12}{6} = 2$

$A(\widehat{ABC}) = 3S \Rightarrow \dfrac{12\cdot 6}{2} = 3S \Rightarrow S = 12$ cm$^2$

$A(\widehat{DEC}) = S = 12$ cm$^2$

**Yanıt / Answer A**

**12.**




[BE] bir açıortaydır. [BE] is a bisector.

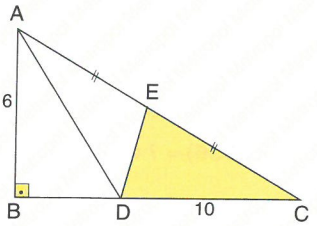
$\dfrac{|AB|}{|BC|} = \dfrac{|AE|}{|EC|} = \dfrac{3}{2} \Rightarrow \begin{cases} |AB| = 3x \\ |BC| = 2x \end{cases}$

$\dfrac{|AF|}{|FD|} = \dfrac{|AB|}{|BD|} = \dfrac{3x}{x} = 3$

$A(\widehat{ADE}) = 36$ cm$^2 \Rightarrow A(\widehat{DEC}) = 24$ cm$^2$

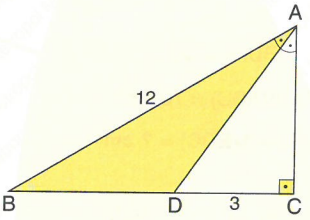
**Yanıt / Answer C**

**1.** [AB] ⊥ [BC],
|AE| = |EC|,
|AB| = 6 cm,
|DC| = 10 cm
⇒ **A($\widehat{DEC}$) = ? cm²**



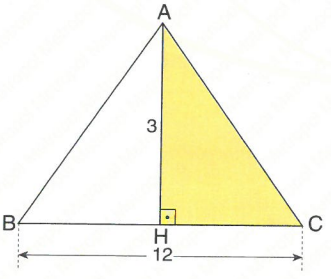

A) 12 B) 15 C) 18 D) 24 E) 30

**2.** [AC] ⊥ [BC],
m($\widehat{BAD}$) = m($\widehat{DAC}$)
|AB| = 12 cm,
|CD| = 3 cm
⇒ **A($\widehat{ABD}$) = ? cm²**



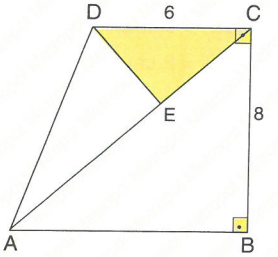

A) 15 B) 16 C) 18 D) 24 E) 36

**3.** [AH] ⊥ [BC]
2·|BH| = |HC|
|BC| = 12 cm,
|AH| = 3 cm
⇒ **A($\widehat{AHC}$) = ? cm²**




A) 9 B) 10 C) 11 D) 12 E) 13

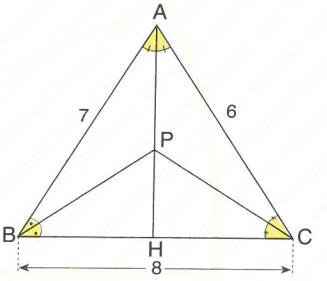
**4.** [DC] ⊥ [BC],
3·|EC| = |AC|
[CB] ⊥ [AB],
|DC| = 6 cm,
|BC| = 8 cm
⇒ **A($\widehat{DEC}$) = ? cm²**




A) 4 B) 5 C) 6 D) 7 E) 8

**5.** [AH], [PC], [BP]
birer iç açıortaydır.
[AH], [PC], [BP] are
interior bisectors.
|AC| = 6 cm,
|AB| = 7 cm,
|BC| = 8 cm

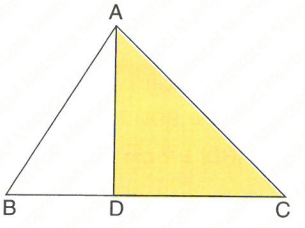
$$\frac{A(\widehat{APC})}{A(\widehat{PBC})} = ?$$




A) $\frac{3}{4}$ B) $\frac{4}{5}$ C) $\frac{9}{10}$ D) 1 E) $\frac{4}{3}$

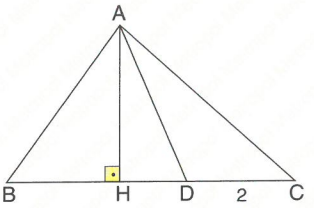
**6.** $\frac{|BD|}{|DC|} = \frac{1}{2}$,

A($\widehat{ABC}$) = 18 cm²
⇒ **A($\widehat{ADC}$) = ? cm²**



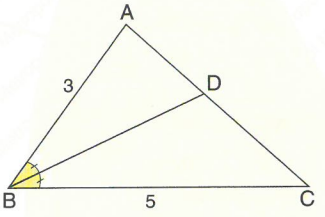

A) 6 B) 8 C) 10 D) 12 E) 16

**7.** [AH] ⊥ [BC]
|BD| = 6 cm,
|DC| = 2 cm,
$A(\widehat{ABC}) = 24\ cm^2$
⇒ **|AH| = ? cm**



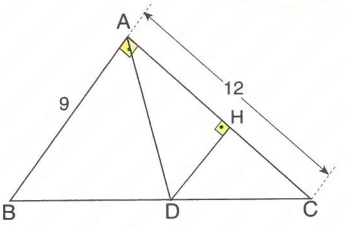

A) 2 B) 3 C) 4 D) 5 E) 6

**8.** $m(\widehat{ABD}) = m(\widehat{CBD})$,
|AB| = 3 cm,
|BC| = 5 cm
$\dfrac{A(\widehat{ABD})}{A(\widehat{ABC})} = ?$



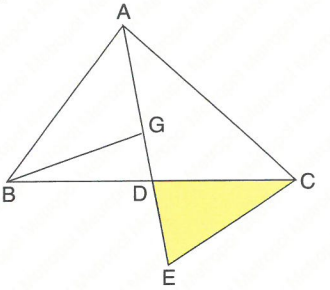

A) $\frac{3}{5}$ B) $\frac{3}{7}$ C) $\frac{3}{8}$ D) $\frac{1}{3}$ E) $\frac{5}{3}$

**9.** [AB] ⊥ [AC],
[HD] ⊥ [AC],
|AB| = 9 cm,
|AC| = 12 cm,
2.|DC| = |BD|
⇒ **|HD| = ? cm**



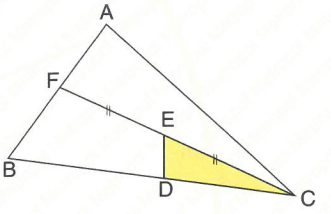

A) 5 B) 4 C) 3 D) 2 E) 1

**10.** G noktası ağırlık merkezidir.
G is center of the gravity.
|DE| = 3·|GD|,
$A(\widehat{ABC}) = 24\ cm^2$.
⇒ **$A(\widehat{DCE})$ = ? $cm^2$**



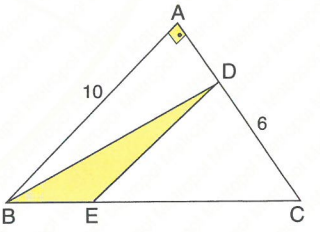

A) 24 B) 21 C) 18 D) 15 E) 12

**11.** $\dfrac{|AF|}{|FB|} = \dfrac{2}{5}$,
|FE|= |EC|,
|BD| = 4|DC|,
$A(\widehat{ABC}) = 70\ cm^2$
⇒ **$A(\widehat{EDC})$ = ? $cm^2$**




A) 14 B) 7 C) 6 D) 5 E) 3

**12.** $m(\widehat{A}) = 90°$,
5|BE| = |EC|
|AB| = 10 cm,
|DC| = 6 cm
⇒ **$A(\widehat{BDE})$ = ? $cm^2$**

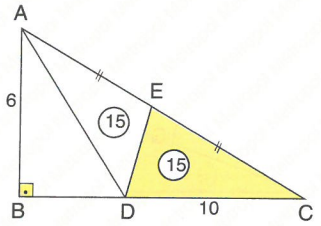



A) 5 B) 6 C) 8 D) 10 E) 14

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | C | D | E | A | D | E | C | C | E | D | A |

**1.**

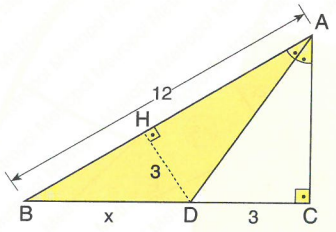



$A(\widehat{ADC}) = \frac{6 \cdot 10}{2} = 30\ cm^2$

$|AE| = |EC| \Rightarrow A(\widehat{DEC}) = \frac{A(\widehat{ADC})}{2} = 15\ cm^2$

Yanıt / Answer **B**

**2.**




[AD] bir açıortaydır. / [AD] is a bisector.

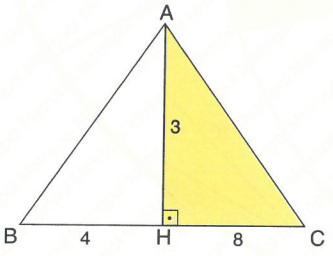
$[DH] \perp [AB]$

$|DC| = |DH| = 3$ cm

$A(\widehat{ABD}) = \frac{3 \cdot 12}{2} = 18\ cm^2$

Yanıt / Answer **C**

**3.**

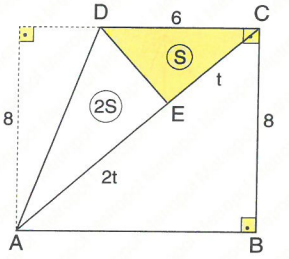



$2|BH| = |HC| \Rightarrow |BH| = 4$ cm, $|HC| = 8$ cm

$\Rightarrow A(\widehat{AHC}) = \frac{3 \cdot 8}{2} = 12\ cm^2$

Yanıt / Answer **D**

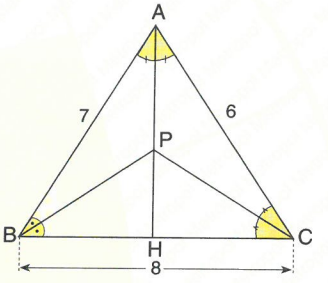
**4.**




$A(\widehat{ADC}) = \frac{8 \cdot 6}{2} = 24\ cm^2 \Rightarrow A(\widehat{DEC}) = 8\ cm^2$

Yanıt / Answer **E**

**5.**



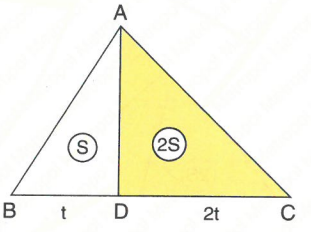

P noktası açıortayların kesim noktasıdır.

P is intersection points of the bisectors.

$\frac{A(\widehat{APC})}{6} = \frac{A(\widehat{BPC})}{8} \Rightarrow \frac{A(\widehat{APC})}{A(\widehat{BPC})} = \frac{6}{8} = \frac{3}{4}$

Yanıt / Answer **A**

**6.**




$|DC| = 2|BD|$

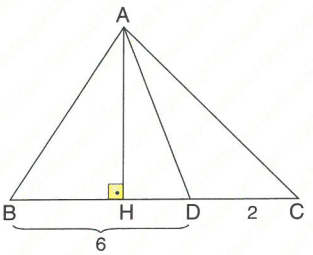
$A(\widehat{ABD}) = S \Rightarrow A(\widehat{ADC}) = 2S$

$A(\widehat{ABC}) = 3S = 18 \Rightarrow S = 6\ cm^2$

$A(\widehat{ADC}) = 2S = 2 \cdot 6 = 12\ cm^2$

Yanıt / Answer **D**

**7.**

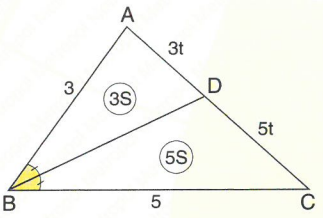



$A(\widehat{ABC}) = \dfrac{|AH| \cdot |BC|}{2} \Rightarrow 24 = \dfrac{|AH| \cdot 8}{2}$

$|AH| = 6$ cm

**Yanıt / Answer E**

**8.**



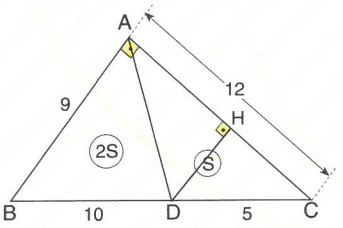

$\dfrac{|AD|}{|DC|} = \dfrac{|AB|}{|BC|} = \dfrac{3}{5}$

$A(\widehat{ABD}) = 3S \Rightarrow A(\widehat{DBC}) = 5S$

$\dfrac{A(\widehat{ABD})}{A(\widehat{ABC})} = \dfrac{3 \cdot S}{8 \cdot S} = \dfrac{3}{8}$

**Yanıt / Answer C**

**9.**



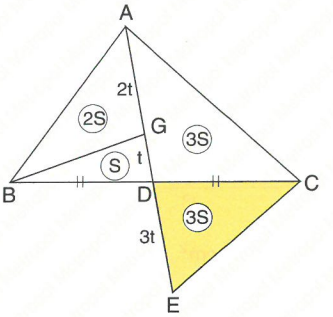

$|BC| = \sqrt{12^2 + 9^2} = 15$ cm $\Rightarrow |DC| = 5$ cm

$A(\widehat{ABC}) = \dfrac{9.12}{2} = 54$ cm$^2 \Rightarrow A(\widehat{ADC}) = 18$ cm$^2$

$\dfrac{|DH|.12}{2} = 18 \Rightarrow |DH| = 3$ cm

**Yanıt / Answer C**

**10.**

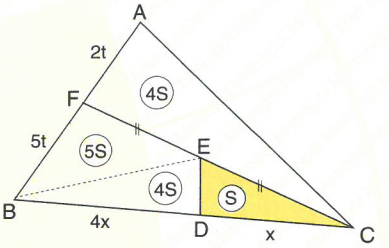



$A(\widehat{ABC}) = 6S = 24$ cm$^2 \Rightarrow S = 4$ cm$^2$

$A(\widehat{CDE}) = 3S = 3 \cdot 4 = 12$ cm$^2$

**Yanıt / Answer E**

**11.**

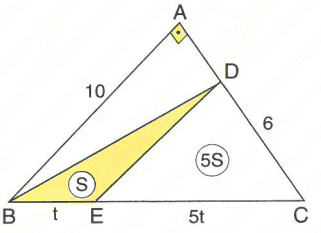



$A(\widehat{ABC}) = 70$ cm$^2$, $A(\widehat{EDC}) = S$

$14S = 70 \Rightarrow S = \dfrac{70}{14} = \dfrac{10}{2} = 5$ cm$^2$

**Yanıt / Answer D**

**12.**



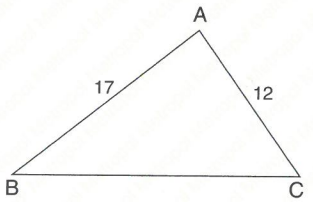

$A(\widehat{BDC}) = \dfrac{10 \cdot 6}{2} = 30$ cm$^2$

$6S = 30 \Rightarrow S = 5$ cm$^2$

$A(\widehat{BDE}) = 5$ cm$^2$

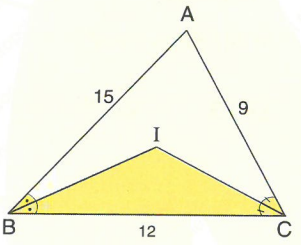
**Yanıt / Answer A**

**1.** $m(\widehat{BAC}) > 90°$,
$|AB| = 17$ cm,
$|AC| = 12$ cm,
$A(\widehat{ABC}) = 90$ cm$^2$
$\Rightarrow$ **$|BC| = ?$ cm**



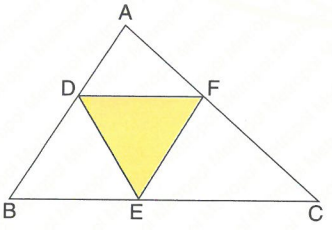

A) 24 B) $18\sqrt{6}$ C) 25 D) 26 E) $24\sqrt{3}$

**2.** $|AB| = 15$ cm,
$|AC| = 9$ cm,
$|BC| = 12$ cm,
$m(\widehat{ABI}) = m(\widehat{IBC})$,
$m(\widehat{ACI}) = m(\widehat{ICB})$
$\Rightarrow$ **$A(\widehat{BIC}) = ?$ cm$^2$**



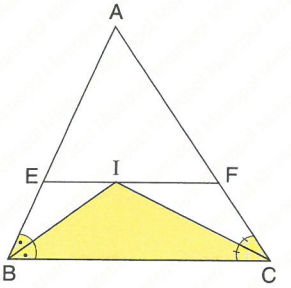

A) $\frac{27}{2}$ B) $\frac{45}{2}$ C) 16 D) 18 E) $\frac{63}{2}$

**3.** $3|AD| = 2|DB|$,
$3|BE| = 2|EC|$,
$4|AF| = |FC|$
$\Rightarrow$ **$\frac{A(\widehat{EFD})}{A(\widehat{ABC})} = ?$**



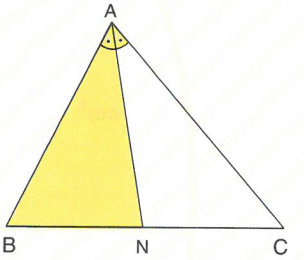

A) $\frac{3}{11}$ B) $\frac{1}{6}$ C) $\frac{2}{3}$ D) $\frac{1}{5}$ E) $\frac{5}{21}$

**4.** $[EF] \parallel [BC]$
$m(\widehat{ABI}) = m(\widehat{IBC})$,
$m(\widehat{ACI}) = m(\widehat{ICB})$
$|EB| = 5$ cm,
$|FC| = 7$ cm,
$|BC| = 16$ cm
$\Rightarrow$ **$A(\widehat{IBC}) = ?$ cm$^2$**



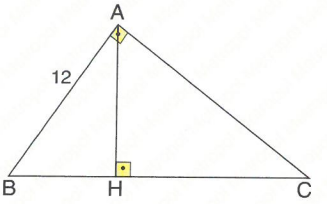

A) $16\sqrt{3}$ B) $24\sqrt{3}$ C) 24 D) $16\sqrt{6}$ E) $8\sqrt{6}$

**5.** $m(\widehat{BAN}) = m(\widehat{NAC})$,
$8|AB| = 3|AC|$,
$A(\widehat{ABN}) = 12$ cm$^2$
$\Rightarrow$ **$A(\widehat{ABC}) = ?$ cm$^2$**



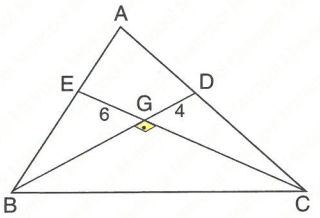

A) 56 B) 44 C) 36 D) 32 E) 30

**6.** $|AB| = 12$ cm,
$[BA] \perp [AC]$,
$[AH] \perp [BC]$,
$|AH| = 3\sqrt{7}$ cm
$\Rightarrow$ **$A(\widehat{ABC}) = ?$ cm$^2$**



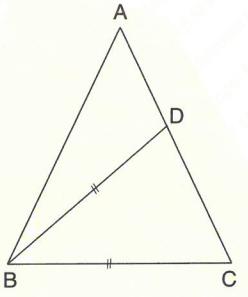

A) $30\sqrt{7}$ B) $24\sqrt{7}$ C) $22\sqrt{7}$ D) 18 E) $13\sqrt{7}$

**7.** G noktası ağırlık merkezidir.
G is center of the gravity.
[BD] ⊥ [CE],
|GD| = 4 cm,
|EG| = 6 cm
⇒ **A($\widehat{ABC}$) = ? cm²**



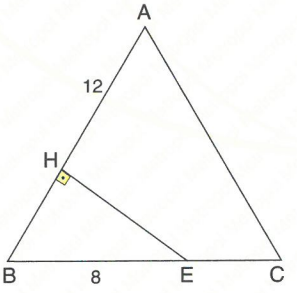

A) 72 B) 96 C) 108 D) 124 E) 144

**8.** |BD| = |BC|,
|AD| = 10 cm,
|DC| = 12 cm,
|AB| = 20 cm
⇒ **A($\widehat{ABC}$) = ? cm²**



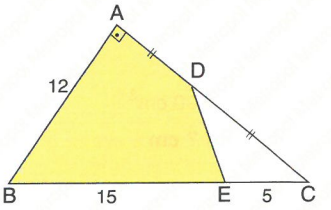

A) $64\sqrt{3}$ B) $81\sqrt{2}$ C) 132 D) $108\sqrt{2}$ E) 164

**9.** |AB| = |BC| = |AC|,
[EH] ⊥ [AB],
|BE| = 8 cm,
|AH| = 12 cm
⇒ **A($\widehat{ABC}$) = ? cm²**



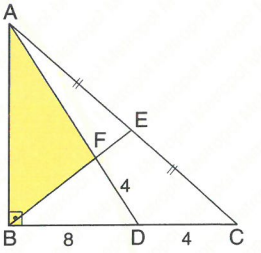

A) $64\sqrt{3}$ B) $48\sqrt{3}$ C) $32\sqrt{3}$ D) $24\sqrt{3}$ E) $12\sqrt{3}$

**10.** [BA] ⊥ [AC],
|AD| = |DC|,
|BE| = 15 cm,
|EC| = 5 cm,
|AB| = 12 cm
⇒ **A(BEDA) = ? cm**



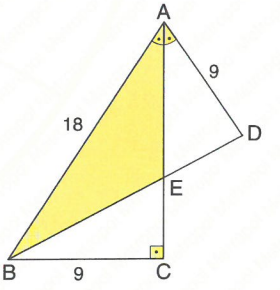

A) 64 B) 72 C) 84 D) 96 E) 108

**11.** |AE| = |EC|,
[AB] ⊥ [BC],
[BE] ∩ [AD] = {F},
|BD| = 8 cm,
|DC| = 4 cm,
|FD| = 4 cm
⇒ **A($\widehat{ABF}$) = ? cm²**




A) $\frac{36}{5}$ B) $\frac{48}{5}$ C) $\frac{56}{5}$ D) $\frac{72}{5}$ E) $\frac{84}{5}$

**12.** m($\widehat{BAC}$) = m($\widehat{CAD}$),
[AC] ⊥ [BC],
|AB| = 18 cm,
|AD| = |BC| = 9 cm
⇒ **A($\widehat{ABE}$) = ? cm²**

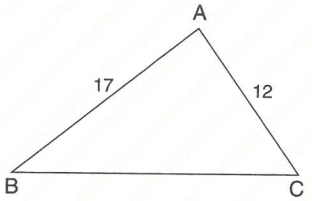



A) $27\sqrt{3}$ B) $18\sqrt{6}$ C) $12\sqrt{6}$ D) $24\sqrt{3}$ E) 36

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | D | D | D | B | B | E | C | A | C | D | A |

**1.**




$m(\widehat{A}) > 90°,\ \widehat{A}(ABC) = \frac{1}{2} \cdot 12 \cdot 17 \cdot \sin\widehat{A} = 90$

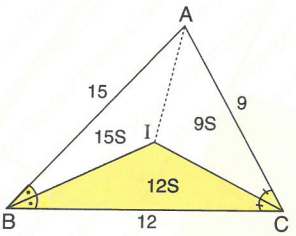
$\sin\widehat{A} = \frac{15}{17} \Rightarrow \cos\widehat{A} = -\frac{8}{17}\ (m(\widehat{A}) > 90°)$

$|BC|^2 = 12^2 + 17^2 - 2 \cdot 12 \cdot 17 \cdot \cos A$

$|BC|^2 = 144 + 289 - 408 \cdot \left(-\frac{8}{17}\right) \Rightarrow |BC| = 25$ cm

**Yanıt / Answer C**

**2.**




$u = \frac{15 + 9 + 12}{2} = 18$ cm

$A(\widehat{ABC}) = \sqrt{18 \cdot (18-15) \cdot (18-9) \cdot (18-12)}$

$A(\widehat{ABC}) = 54\ cm^2$

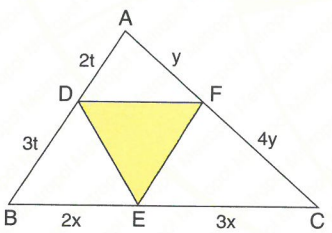
I açıortayların kesim noktasıdır.

The point I is intersection of bisectors.

$\frac{A(\widehat{BIC})}{A(\widehat{ABC})} = \frac{12}{12 + 15 + 9} \Rightarrow A(\widehat{BIC}) = 18\ cm^2$

**Yanıt / Answer D**

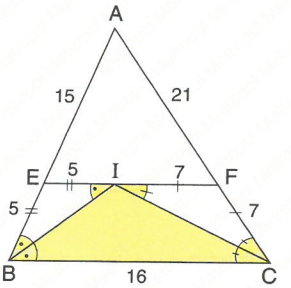
**3.**




$\frac{A(\widehat{DEF})}{A(\widehat{ABC})} = \frac{2x \cdot 4y \cdot 2t + 3x \cdot y \cdot 3t}{5x \cdot 5y \cdot 5t} = \frac{1}{5}$

**Yanıt / Answer D**

**4.**




$|EF| = 12$ ve(&) $\frac{|EF|}{|BC|} = \frac{12}{16} = \frac{3}{4} \Rightarrow |AE| = 15,\ |AF| = 21$

$A(\widehat{ABC}) = \sqrt{32 \cdot (32-16) \cdot (32-20) \cdot (32-28)}$

$\Rightarrow A(\widehat{ABC}) = 64\sqrt{6}\ cm^2$

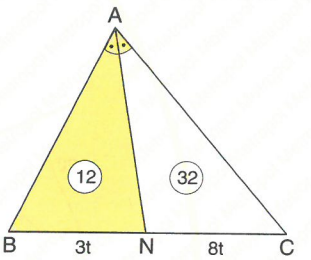
$\frac{A(\widehat{IBC})}{A(\widehat{ABC})} = \frac{16}{20 + 16 + 28} \Rightarrow A(\widehat{IBC}) = 16\sqrt{6}\ cm^2$

**Yanıt / Answer D**

**5.** $\frac{|NC|}{|NB|} = \frac{|AC|}{|AB|} = \frac{8}{3}$

[AN] bir açıortaydır.

[AN] is a bisector.



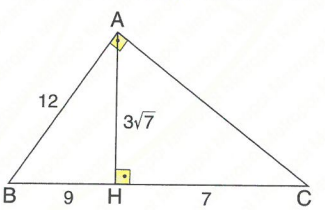

$\frac{A(\widehat{ANC})}{A(\widehat{ABN})} = \frac{|NC|}{|BN|} = \frac{8}{3}$

$A(\widehat{ABN}) = 12\ cm^2 \Rightarrow A(\widehat{ANC}) = 32\ cm^2$

$A(\widehat{ABC}) = 12 + 32 = 44\ cm^2$

**Yanıt / Answer B**

**6.**




$|BH| = \sqrt{12^2 - (3\sqrt{7})^2}$ [Pythagor]

$|BH| = 9$ cm

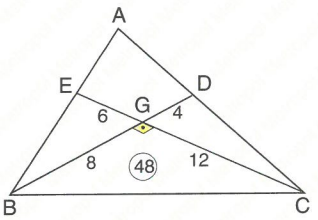
$|AH|^2 = |BH| \cdot |HC|$ [Euclid]

$63 = 9 \cdot |HC| \Rightarrow |HC| = 7$ cm

$A(\widehat{ABC}) = \frac{3\sqrt{7} \cdot 16}{2} = 24\sqrt{7}\ cm^2$

**Yanıt / Answer B**

**7.**




G noktası şekildeki ABC üçgeninin ağırlık merkezidir.

Point G is center of the gravity, in the ABC triangle.

$|EG| = 6 \Rightarrow |GC| = 12$ cm

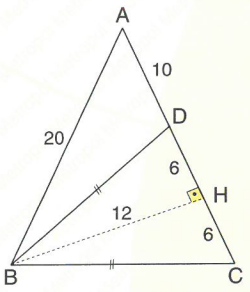
$|GD| = 4 \Rightarrow |GB| = 8$ cm

$A(\widehat{GBC}) = \frac{12 \cdot 8}{2} = 48\text{cm}^2$

$A(\widehat{ABC}) = 3 \cdot A(\widehat{GBC}) = 3 \cdot 48 = 144\ \text{cm}^2$

**Yanıt / Answer E**

**8.**




ABH dik üçgendir. / ABH is a right triangle.

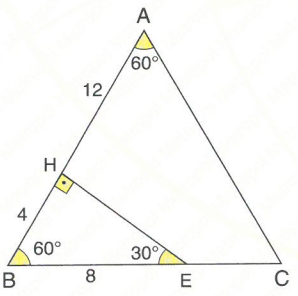
$|BH|^2 = |AB|^2 - |AH|^2$ [Pythagor ]

$|BH|^2 = 20^2 - 16^2 \Rightarrow |BH| = 12$ cm

$A(\widehat{ABC}) = \frac{|BH| \cdot |AC|}{2} \Rightarrow A(\widehat{ABC}) = \frac{12 \cdot 22}{2} = 132\text{cm}^2$

**Yanıt / Answer C**

**9.**




30°, 60°, 90° üçgeninden aşağıdaki sonuçlar bulunur.

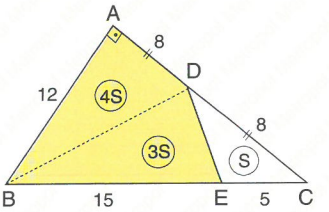
By using 30°, 60°, 90° triangles, we obtain following results.

$|BE| = 8$ cm $\Rightarrow |HB| = 4$ cm, $|AB| = 12 + 4 = 16$ cm

$A(\widehat{ABC}) = \frac{16^2 \cdot \sqrt{3}}{4} = 64\sqrt{3}\ \text{cm}^2$

**Yanıt / Answer A**

**10.**



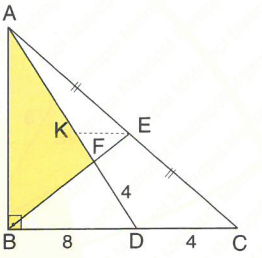

$A(\widehat{DEC}) = S \Rightarrow A(\widehat{BDE}) = 3,\ A(\widehat{ABD}) = 4S$

$A(\widehat{ABC}) = \frac{12 \cdot 16}{2} = 8S \Rightarrow S = 12\ \text{cm}^2$

$A(ABED) = 7S = 12 \cdot 7 = 84\ \text{cm}^2$

**Yanıt / Answer C**

**11.**




$[KE] \parallel [BC] \Rightarrow |DC| = 4$

$|KE| = 2$ cm [orta taban / middle base ]

$\widehat{KEF} \sim \widehat{FBD} \Rightarrow$

$\frac{|KE|}{|BD|} = \frac{|KF|}{|FD|} \Rightarrow \frac{2}{8} = \frac{|KF|}{4} \Rightarrow |KF| = 1$ cm

$|AK| = |KD| \Rightarrow |AK| = 5$ cm

$|AB|^2 = |AD|^2 - |BD|^2$ [Pythagor ]

$|AB|^2 = 10^2 - 8^2 \Rightarrow |AB| = 6$ cm

$A(\widehat{ABF}) = \frac{6}{10} \cdot \frac{6 \cdot 8}{2} = \frac{72}{5}\ \text{cm}^2$

**Yanıt / Answer D**

**12.** $|DE| = t$,

$|BE| = 2t$,

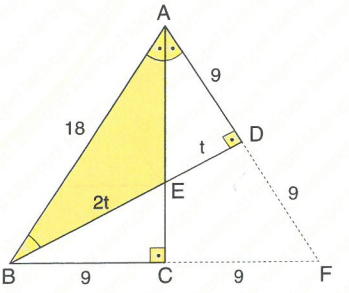
[AE] bir açıortaydır.

[AE] is a bisector.

$|AB| = |AF| = |BF|$,

$|AD| = |DF|$,

$|AD| \perp [BD]$,



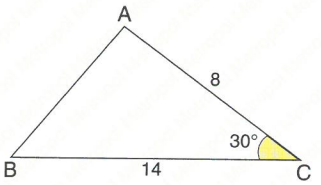

$18^2 = 9^2 + (3t)^2$ [ Pythagor ]

$t = 3\sqrt{3} \Rightarrow |BE| = 6\sqrt{3}$ cm

$A(\widehat{ABE}) = \frac{6\sqrt{3} \cdot 9}{2} = 27\sqrt{3}\ \text{cm}^2$

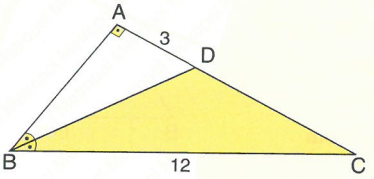
**Yanıt / Answer A**

1. $m(\widehat{BAC}) = 30°$,
$|AC| = 8$,
$|BC| = 14$
$\Rightarrow$ **$A(\widehat{ABC}) = ?\ cm^2$**




A) 24 B) 26 C) 28 D) 30 E) 32

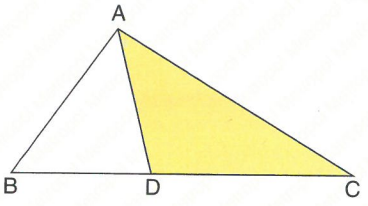
2.




$m(\widehat{A}) = 90°$, $m(\widehat{ABD}) = m(\widehat{DBC})$, $|AD| = 3$ cm,
$|BC| = 12$ cm
$\Rightarrow$ **$A(\widehat{BDC}) = ?\ cm^2$**

A) 16 B) 18 C) 20 D) 22 E) 24

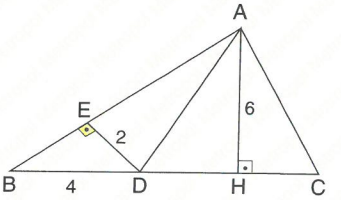
3.




$3 \cdot |BD| = |BC|$, $A(\widehat{ABC}) = 21\ cm^2$ $\Rightarrow$ **$A(\widehat{ADC}) = ?\ cm^2$**

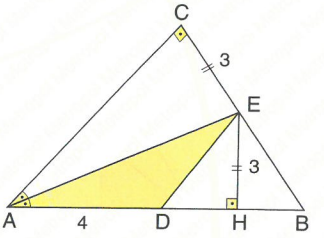
A) 7 B) 9 C) 12 D) 14 E) 16

4. $[AH] \perp [BC]$,
$[AB] \perp [DE]$,
$|AH| = 6$ cm,
$|BD| = 4$ cm,
$|ED| = 2$ cm
$\Rightarrow$ **$|AB| = ?$ cm**



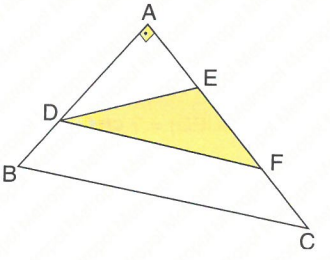

A) 7 B) 8 C) 9 D) 10 E) 12

5. $m(\widehat{ACB}) = 90°$,
$m(\widehat{CAE}) = m(\widehat{EAB})$,
$|CE| = 3$ cm,
$|AD| = 4$ cm
$\Rightarrow$ **$A(\widehat{AED}) = ?\ cm^2$**



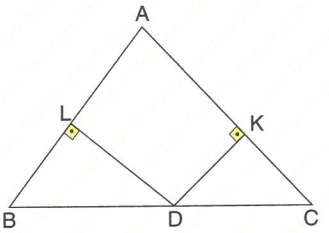

A) 24 B) 12 C) 6 D) 4 E) 2

6. $m(\widehat{A}) = 90°$,
$|AB| = 3 \cdot |BD|$,
$|EF| = \frac{|AC|}{2}$,
$|AB| = 9$ cm,
$|AC| = 12$ cm.
$\Rightarrow$ **$A(\widehat{DEF}) = ?\ cm^2$**



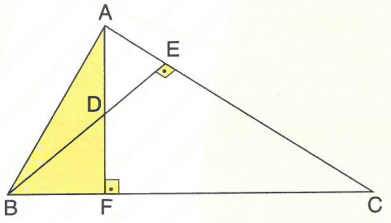

A) 16 B) 18 C) 20 D) 24 E) 30

**7.** [DL] ⊥ [AB],
[AC] ⊥ [DK]
IABI = IACI = 8 cm,
IDLI + IDKI = 6 cm,
⇒ **A($\widehat{ABC}$) = ? cm²**




A) 48 B) 42 C) 38 D) 36 E) 24

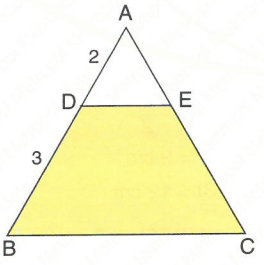
**8.**




[AF] ⊥ [BC], [BE] ⊥ [AC], IBEI = IECI,
IBCI = 8 cm, IDFI = 3 cm ⇒ **A($\widehat{ABF}$) = ? cm²**

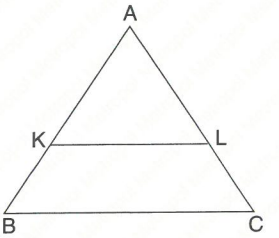
A) 6 B) 7 C) $\frac{15}{2}$ D) 8 E) 12

**9.** [DE] // [BC],
IADI = 2 cm,
IBDI = 3 cm,
A($\widehat{ABC}$) = 75 cm²
⇒ **A(BCED) = ? cm²**



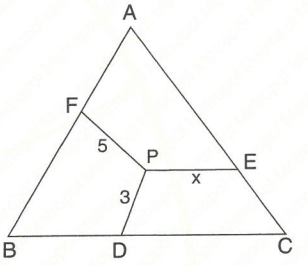

A) 52 B) 58 C) 60 D) 63 E) 72

**10.** [KL] // [BC],
A($\widehat{AKL}$) = A(BCLK)
⇒ **$\frac{IAKI}{IABI}$ = ?**



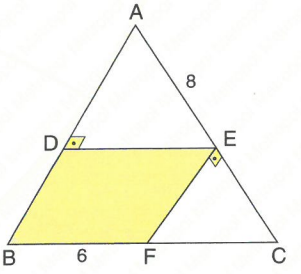

A) $\frac{1}{\sqrt{2}}$ B) $\sqrt{2}$ C) $\frac{1}{2}$ D) 1 E) 2

**11.** IABI = IACI = IBCI,
[PE] // [BC],
[PF] // [AC],
[PD] // [AB],
A($\widehat{ABC}$) = $36\sqrt{3}$ cm²,
IPFI = 5 cm,
IPDI = 3 cm
**IPEI = x = ? cm**




A) 3 B) $\frac{7}{2}$ C) 4 D) $\frac{9}{2}$ E) 5

**12.** IABI = IACI = IBCI,
[ED] ⊥ [AB],
[FE] ⊥ [AC],
IAEI = 8 cm,
IBFI = 6 cm
⇒ **A(BFED) = ? cm²**

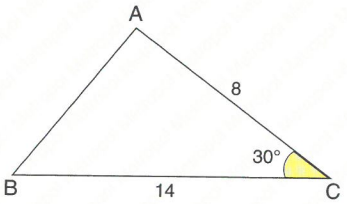



A) $12\sqrt{3}$ B) $15\sqrt{3}$ C) $16\sqrt{3}$ D) $18\sqrt{3}$ E) $20\sqrt{3}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | B | D | E | C | B | E | C | D | A | C | B |

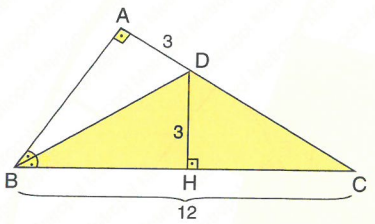
**1.**




$A(\widehat{ABC}) = \dfrac{8 \cdot 14 \cdot \sin 30^o}{2} = 28\ cm^2$

**Yanıt / Answer C**

**2.**




[BD] bir açıortaydır. / [BD] is a bisector.

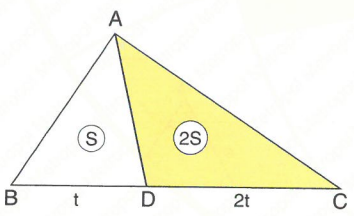
$[DH] \perp [BC]$

$|AD| = |DH| = 3$ cm

$A(\widehat{BDC}) = \dfrac{3.12}{2} = 18\ cm^2$

**Yanıt / Answer B**

**3.**



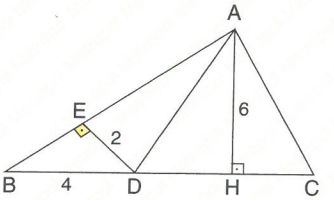

$A(\widehat{ABD}) = S \Rightarrow A(\widehat{ADC}) = 2S$

$3 \cdot S = 21 \Rightarrow S = 7\ cm^2$

$A(\widehat{ADC}) = 2 \cdot S = 14\ cm^2$

**Yanıt / Answer D**

**4.**



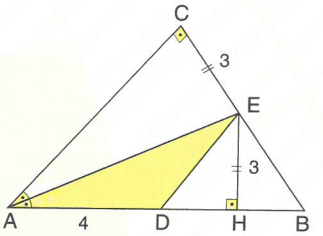

$A(\widehat{ABD}) = \dfrac{|BD| \cdot |AH|}{2} = \dfrac{4 \cdot 6}{2} = 12\ cm^2$

$A(\widehat{ABD}) = \dfrac{|ED| \cdot |AB|}{2}$

$24 = 2 \cdot |AB| \Rightarrow |AB| = 12$ cm

**Yanıt / Answer E**

**5.**



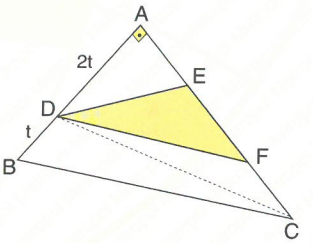

[EA] bir açıortaydır. / [AE] is a bisector.

$|CE| = |EH| = 3$ cm

$A(\widehat{AED}) = \dfrac{4 \cdot 3}{2} = 6\ cm^2$

**Yanıt / Answer C**

**6.**



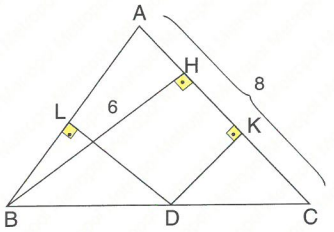

$\left.\begin{array}{l} |AB| = 9 \\ |AC| = 12 \end{array}\right\} \Rightarrow A(\widehat{ABC}) = 54\ cm^2$

$A(\widehat{DCB}) = 18\ cm^2$ & $A(\widehat{ADC}) = 36\ cm^2$

$|EF| = \dfrac{|AC|}{2} \Rightarrow A(\widehat{DEF}) = \dfrac{A(\widehat{ADC})}{2} = \dfrac{36}{2} = 18\ cm^2$

**Yanıt / Answer B**

**7.**




ABC bir ikizkenar üçgendir.

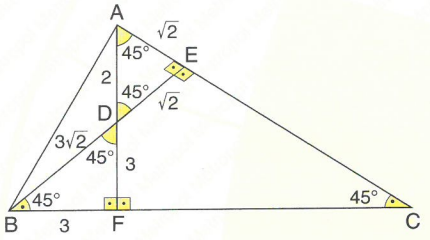
ABC is an isosceles triangle.

$|BH| = |DL| + |DK| = 6$ cm dir.

$A(\widehat{ABC}) = \dfrac{|BH| \cdot |AC|}{2} = \dfrac{8 \cdot 6}{2} = 24 \text{ cm}^2$

**Yanıt / Answer E**

**8.**




$\perp\ \widehat{EBC}\ (45°, 45°, 90°) \Rightarrow$

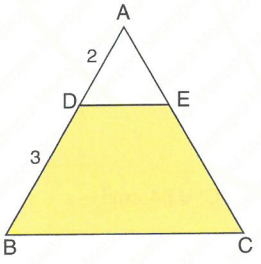
$|BC| = 8 \text{ cm} \Rightarrow |BE| = |EC| = \dfrac{\sqrt{2}}{2} \cdot 8 = 4\sqrt{2} \text{ cm}$

$|AD| = 2 \text{ cm} \Rightarrow |AE| = |ED| = \sqrt{2} \text{ cm}$

$A(\widehat{ABF}) = \dfrac{5 \cdot 3}{2} = \dfrac{15}{2} \text{ cm}^2$

**Yanıt / Answer C**

**9.**



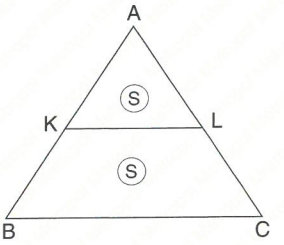

$\dfrac{|AD|}{|AB|} = \dfrac{2}{5}$

$\dfrac{A(\widehat{ADE})}{A(ABC)} = \left(\dfrac{2}{5}\right)^2 \Rightarrow A(\widehat{ADE}) = 75 \cdot \dfrac{4}{25} = 12 \text{ cm}^2$

$A(BCED) = 75 - 12 = 63 \text{ cm}^2$

**Yanıt / Answer D**

**10.**

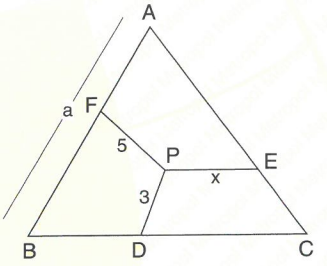



$\widehat{AKL} \sim \widehat{ABC} \Rightarrow \dfrac{A(\widehat{AKL})}{A(\widehat{ABC})} = \left(\dfrac{|AK|}{|AB|}\right)^2$

$\dfrac{S}{2S} = \left(\dfrac{|AK|}{|AB|}\right)^2 \Rightarrow \dfrac{1}{\sqrt{2}} = \dfrac{|AK|}{|AB|}$

**Yanıt / Answer A**

**11.**




$A(\widehat{ABC}) = \dfrac{\sqrt{3}}{4} \cdot a^2 \Rightarrow 36\sqrt{3} = \dfrac{\sqrt{3}a^2}{4} \Rightarrow a = 12\text{m}$

ABC üçgeni eşkenar üçgendir.

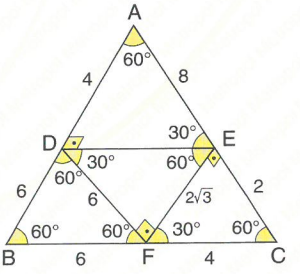
ABC is an equilateral triangle.

$|PF| + |PE| + |PD| = a$

$5 + x + 3 = 12 \Rightarrow x = 4$ cm

**Yanıt / Answer C**

**12.**



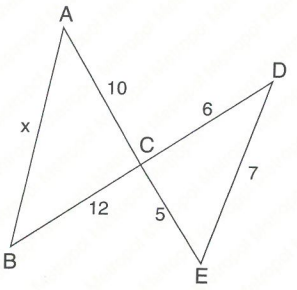

$A(BFED) = A(\widehat{DBF}) + A(\widehat{DFE})$

$= \dfrac{6^2 \cdot \sqrt{3}}{4} + \dfrac{6 \cdot 2\sqrt{3}}{2}$

$= 9\sqrt{3} + 6\sqrt{3} = 15\sqrt{3} \text{ cm}^2$

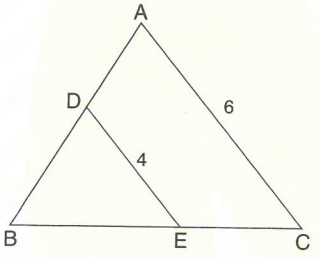
**Yanıt / Answer B**

**1.** |AC| = 10 cm,
|CE| = 5 cm,
|CD| = 6 cm,
|DE| = 7 cm,
|CB| = 12 cm
⇒ **|AB| = x = ? cm**



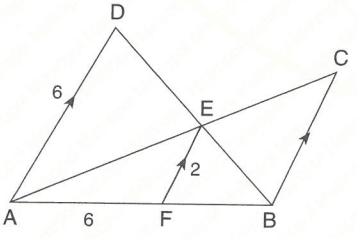

A) 12 B) 12,5 C) 13 D) 13,5 E) 14

**2.** [DE] // [AC]
|DE| = 4 cm,
|AC| = 6 cm
⇒ $\frac{|EC|}{|EB|}$ = ?




A) $\frac{7}{10}$ B) $\frac{2}{3}$ C) $\frac{3}{5}$ D) $\frac{1}{2}$ E) $\frac{2}{5}$

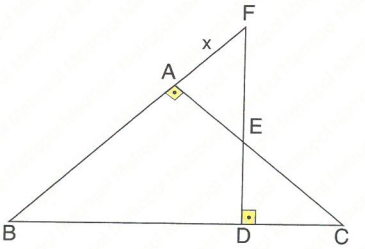
**3.**




[DA] // [EF] // [CB], |AD| = |AF| = 6 cm,
|EF| = 2 cm ⇒ **|FB| + |BC| = ? cm**

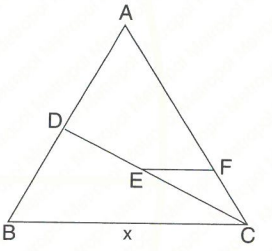
A) 4 B) 4,5 C) 5 D) 6 E) 8

**4.** [FB] ⊥ [AC],
[FD] ⊥ [BC],
|AC| = 4 cm,
|AB| = 3 cm,
|DC| = 1 cm
⇒ **|AF| = x = ? cm**



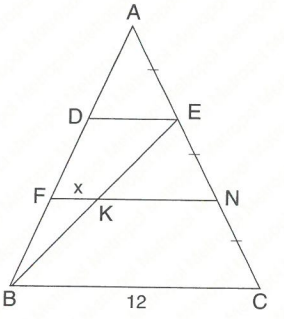

A) $\frac{8}{3}$ B) $\frac{10}{3}$ C) $\frac{11}{3}$ D) $\frac{9}{2}$ E) $\frac{11}{2}$

**5.** [EF] // [BC],
|DE| = $\frac{3}{2}$|EC|,
$\frac{|AD|}{|DB|}$ = 3,
|EF| = 3 cm
⇒ **|BC| = x = ? cm**



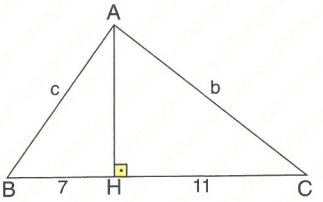

A) 10 B) 12 C) 16 D) 18 E) 24

**6.** [DE] // [FN] // [BC],
|AE| = |EN| = |NC|,
|BC| = 12 cm
⇒ **|FK| = x = ? cm**



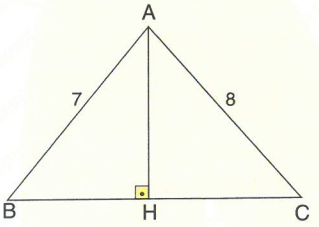

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) 2 E) $\frac{5}{2}$

**7.** $[AH] \perp [BC]$,
$|BH| = 7$ cm,
$|HC| = 11$ cm,
$|AB| = c$ cm,
$|AC| = b$ cm,
$b, c \in N$
$\Rightarrow$ **$A(\widehat{ABC}) = ?$ cm$^2$**



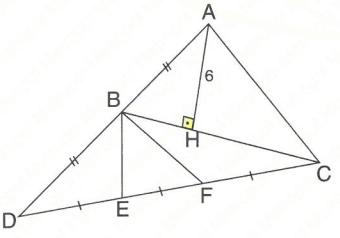

A) $27\sqrt{5}$ B) $54\sqrt{3}$ C) $36\sqrt{15}$ D) $28\sqrt{5}$ E) 54

**8.** $|AB| = 7$ cm,
$|AC| = 8$ cm,
$|BC| = 5$ cm,
$[AH] \perp [BC]$
$\Rightarrow$ **$|AH| = ?$ cm**



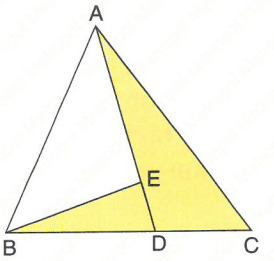

A) $2\sqrt{3}$ B) $3\sqrt{3}$ C) $4\sqrt{3}$ D) $3\sqrt{5}$ E) $6\sqrt{5}$

**9.** $|AB| = |BD|$,
$|DE| = |EF| = |FC|$,
$[AH] \perp [BC]$,
$A(\widehat{BEF}) = 16$ cm$^2$,
$|AH| = 6$ cm
$\Rightarrow$ **$|BC| = ?$ cm**



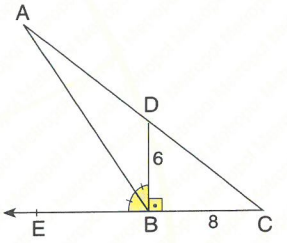

A) 10 B) 12 C) 13 D) 14 E) 16

**10.** $|BD| = 5 \cdot |DC|$,
$3 \cdot |DE| = 2 \cdot |AE|$
$\Rightarrow \dfrac{A(BCAE)}{A(\widehat{ABC})} = ?$



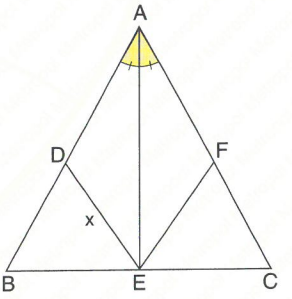

A) $\frac{1}{5}$ B) $\frac{2}{3}$ C) $\frac{3}{4}$ D) $\frac{1}{2}$ E) $\frac{3}{5}$

**11.** $[BD] \perp [CB]$,
$m(\widehat{DBA}) = m(\widehat{ABE})$,
$|BC| = 8$ cm,
$|BD| = 6$ cm
$\Rightarrow$ **$A(\widehat{ABC}) = ?$ cm$^2$**




A) 72 B) 96 C) 144 D) 256 E) 284

**12.** $m(\widehat{BAE}) = m(\widehat{EAC})$,
$[AB] \,//\, [EF]$,
$[AC] \,//\, [DE]$,
$|AB| = 8$ cm,
$|AC| = 10$ cm
$\Rightarrow$ **$|ED| = x = ?$ cm**

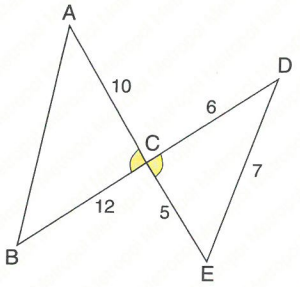



A) $\frac{9}{40}$ B) $\frac{30}{9}$ C) $\frac{40}{9}$ D) $\frac{9}{30}$ E) $\frac{11}{32}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | D | D | C | A | D | C | C | E | D | B | C |

**1.**

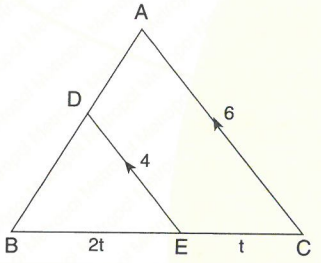



$\frac{|DC|}{|BC|} = \frac{|EC|}{|AC|} = \frac{1}{2}$

$\widehat{DEC} \sim \widehat{ABC} \Rightarrow \frac{|DE|}{|AB|} = \frac{1}{2} \Rightarrow |AB| = 14$ cm

**Yanıt / Answer E**

**2.**

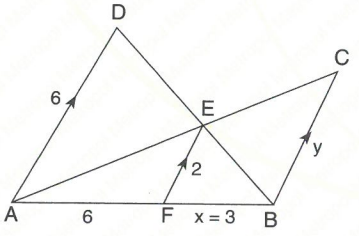



$\widehat{ABC} \sim \widehat{DBE} \Rightarrow \frac{|BE|}{|BC|} = \frac{4}{6} = \frac{2}{3} = \frac{2t}{3t}$

$\frac{|EC|}{|EB|} = \frac{t}{2t} = \frac{1}{2}$

**Yanıt / Answer D**

**3.**



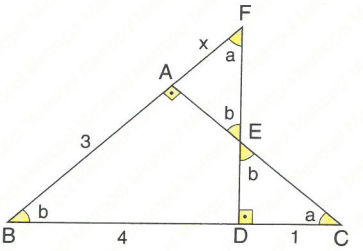

$\widehat{BFE} \sim \widehat{BAD} \Rightarrow \frac{x}{x+6} = \frac{2}{6} \Rightarrow x = 3$ cm

$\widehat{AFE} \sim \widehat{ABC} \Rightarrow \frac{6}{9} = \frac{2}{y} \Rightarrow y = 3$ cm

$|FB| + |BC| = 6$ cm

**Yanıt / Answer D**

**4.**




$|AC| = 4$ cm, $|AB| = 3$ cm

$|BC|^2 = |AC|^2 + |AB|^2 = 3^2 + 4^2 = 25$

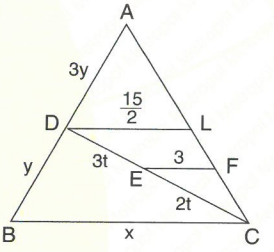
$|BC| = 5$ cm

$\widehat{ABC} \sim \widehat{BFD} \Rightarrow \frac{|BC|}{|BF|} = \frac{|AB|}{|BD|} \Rightarrow$

$\frac{5}{x+3} = \frac{3}{4} \Rightarrow x = \frac{11}{3}$ cm

**Yanıt / Answer C**

**5.**




[BC] // [DL] çizilirse, aşağıdaki sonuç bulunur.

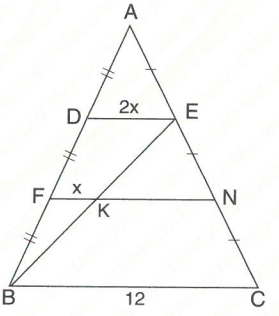
By drawing [BC] // [DL], we obtain following result.

$\frac{|CE|}{|CD|} = \frac{|EF|}{|DL|} \Rightarrow \frac{2}{5} = \frac{3}{|DL|} \Rightarrow |DL| = \frac{15}{2}$ cm

$\frac{|AD|}{|AB|} = \frac{|DL|}{|BC|} \Rightarrow \frac{3}{4} = \frac{\frac{15}{2}}{x} \Rightarrow x = 10$ cm

**Yanıt / Answer A**

**6.**

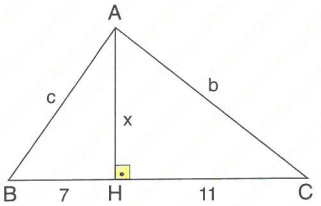



$\widehat{BFK} \sim \widehat{BDE} \Rightarrow \frac{|FK|}{|DE|} = \frac{|BF|}{|BD|} = \frac{1}{2} \Rightarrow |DE| = 2x$

$\widehat{ADE} \sim \widehat{ABC} \Rightarrow \frac{|AD|}{|AB|} = \frac{|DE|}{|BC|} \Rightarrow \frac{1}{3} = \frac{2x}{12} \Rightarrow x = 2$ cm

**Yanıt / Answer D**

**7.**




$$\left.\begin{array}{l} x^2+11^2=b^2 \\ x^2+7^2=c^2 \end{array}\right\} \Rightarrow \begin{array}{l} b^2-c^2=72 \\ (b-c)\cdot(b+c)=72 \end{array}$$

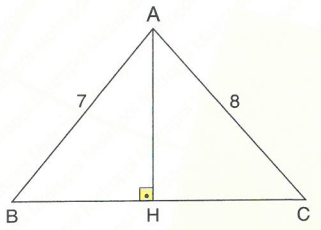
$$\left.\begin{array}{l} b+c=36 \\ b-c=2 \end{array}\right\} \Rightarrow b=19,\ c=17 \left(\begin{array}{l} \widehat{AHC}=\widehat{AHB}=90^\circ \Rightarrow \\ b>11,\ c<7 \end{array}\right)$$

$$|AH| = 4\sqrt{15}\ \text{cm}$$

$$A(\widehat{ABC}) = 36\sqrt{15}\ \text{cm}^2$$

**Yanıt / Answer C**

**8.**




$$u = \frac{7+8=5}{2} = 10\ \text{cm}$$

$$A(\widehat{ABC}) = \sqrt{10\cdot(10-8)\cdot(10-7)\cdot(10-5)}$$

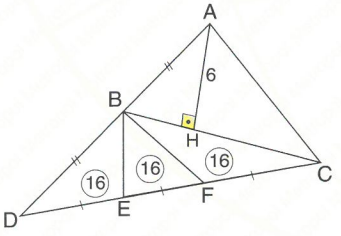
$$A(\widehat{ABC}) = 10\sqrt{3}\ \text{cm}^2$$

$$A(\widehat{ABC}) = \frac{|AH|\cdot|BC|}{2}$$

$$10\sqrt{3} = \frac{|AH|\cdot 5}{2} \Rightarrow |AH| = 4\sqrt{3}\ \text{cm}$$

**Yanıt / Answer C**

**9.**

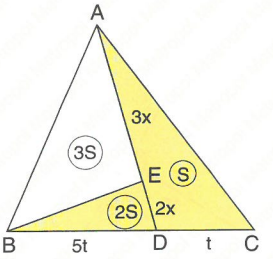



$$A(\widehat{BDC}) = A(\widehat{ABC}) = 48\ \text{cm}^2 \Rightarrow$$

$$48 = \frac{6\cdot|BC|}{2} \Rightarrow |BC| = 16\ \text{cm}$$

**Yanıt / Answer E**

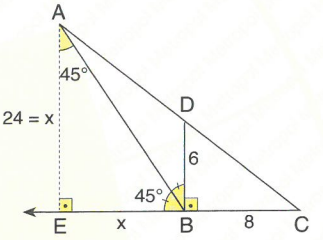
**10.**




$$\frac{A(BCAE)}{A(\widehat{ABC})} = \frac{3S}{6S} = \frac{1}{2}$$

**Yanıt / Answer D**

**11.**

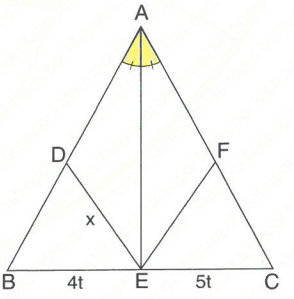



$$\widehat{CBD} \sim \widehat{CEA} \Rightarrow \frac{6}{x} = \frac{8}{8+x} \Rightarrow x = 24\ \text{cm}$$

$$A(\widehat{ABC}) = \frac{24\cdot 8}{2} = 96\ \text{cm}^2$$

**Yanıt / Answer B**

**12.**




[AE] bir açıortaydır. / [AE] is a bisector.

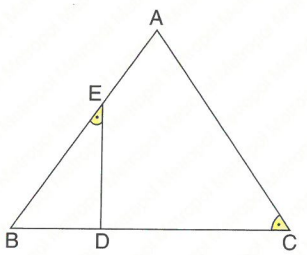
$$\frac{|AC|}{|AB|} = \frac{|EC|}{|EB|} \Rightarrow \frac{10}{8} = \frac{|EC|}{|EB|} \Rightarrow \frac{|EC|}{|EB|} = \frac{5}{4}$$

$$\widehat{BDE} \sim \widehat{BAC} \Rightarrow$$

$$\frac{|BE|}{|BC|} = \frac{|DE|}{|AC|} \Rightarrow \frac{4}{9} = \frac{x}{10} \Rightarrow x = \frac{40}{9}\ \text{cm}$$

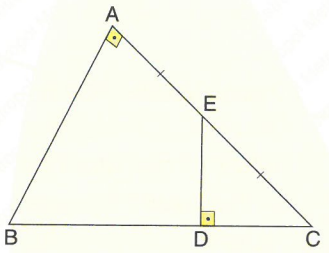
**Yanıt / Answer C**

**1.** $m(\widehat{BED}) = m(\widehat{ACB})$,
$|AB| = 12$ cm,
$|BC| = 8$ cm,
$|AE| = |BD|$
$\Rightarrow$ **$|AE| = ?$ cm**



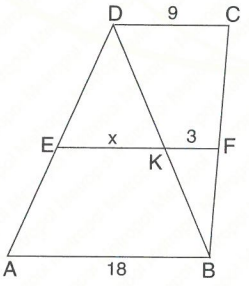

A) 3 B) 3,6 C) 5,4 D) 6,8 E) 7,2

**2.** $[BA] \perp [AC]$,
$[ED] \perp [BC]$,
$|AE| = |EC|$,
$|BC| = 18$ cm,
$|DC| = 4$ cm
$\Rightarrow$ **$|AC| = ?$ cm**



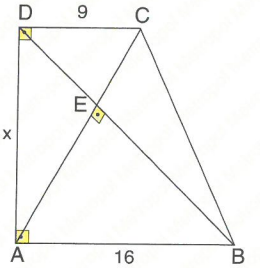

A) 8 B) 10 C) 12 D) 16 E) 20

**3.** $[DC] // [EF] // [AB]$,
$K \in [EF]$,
$|DC| = 9$ cm,
$|KF| = 3$ cm,
$|AB| = 18$ cm
$\Rightarrow$ **$|EK| = x = ?$ cm**



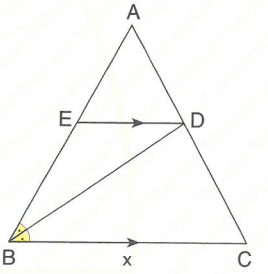

A) 8 B) 9 C) 10 D) 12 E) 15

**4.** $[DA] \perp [AB]$,
$[DB] \perp [AC]$,
$[AB] // [DC]$,
$|AB| = 16$ cm,
$|DC| = 9$ cm
$\Rightarrow$ **$|AD| = x = ?$ cm**



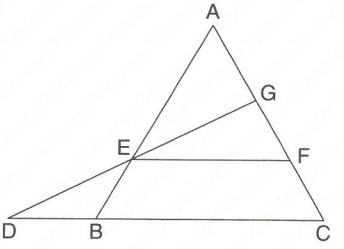

A) 4 B) 6 C) 8 D) 10 E) 12

**5.** $[ED] // [BC]$,
$m(\widehat{ABD}) = m(\widehat{DBC})$,
$3 \cdot |AD| = 4 \cdot |DC|$,
$|EB| = 6$ cm
$\Rightarrow$ **$|BC| = x = ?$ cm**




A) 10,5 B) 11 C) 11,5 D) 12 E) 12,5

**6.** $[EF] // [DC]$,
$|AG| = 3 \cdot |GF| = 2 \cdot |FC|$,
$|DB| = 10$ cm
$\Rightarrow$ **$|EF| + |BC| = ?$ cm**




A) $\frac{59}{3}$ B) 20 C) $\frac{62}{3}$ D) 21 E) $\frac{190}{9}$

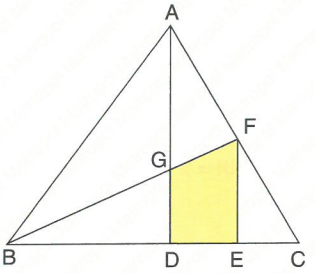
**7.** G noktası ağırlık merkezidir.

G is center of the gravity.

[GD] // [EF],

$A(\widehat{ECF}) = 9\ cm^2$

$\Rightarrow$ **$A(\widehat{GDEF}) = ?\ cm^2$**

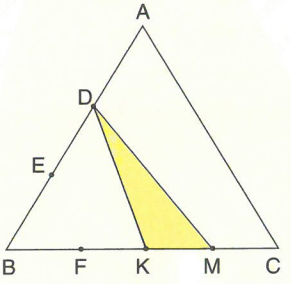



A) 12 B) 15 C) 18 D) 21 E) 23

**8.** |EB| = |ED| = |DA|,

|BF| = |FK| = |KM| = |MC|

$\Rightarrow \dfrac{A(\widehat{DKM})}{A(\widehat{ABC})} = ?$




A) $\frac{1}{6}$ B) $\frac{1}{5}$ C) $\frac{1}{4}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

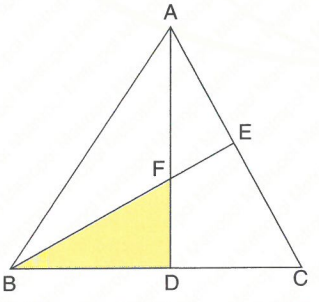
**9.** |EC| = 2·|AE|,

|DC| = 3·|DB|,

|BF| = |EF|

TA(SA) = 3 $cm^2$.

$\Rightarrow$ **$A(\widehat{ABC}) = ?\ cm^2$**



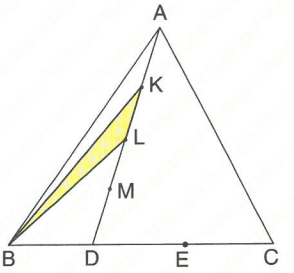

A) 12 B) 16 C) 24 D) 36 E) 42

**10.** |BD| = |DE| = |EC|,

|AK| = |KL| = |LM| = |MD|,

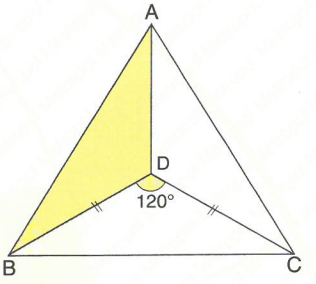
$A(\widehat{BKL}) = 5\ cm^2$

$\Rightarrow$ **$A(\widehat{ABC}) = ?\ cm^2$**




A) 48 B) 56 C) 60 D) 64 E) 68

**11.**




ABC bir eşkenar, BCD bir ikizkenar üçgendir.

ABC is an equaliteral, BCD is an isosceles triangle.

$m(\widehat{BDC}) = 120°$, |BC| = 4 cm

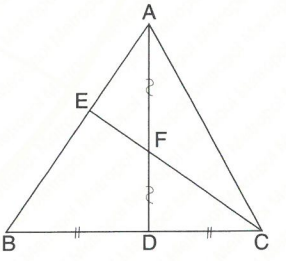
$\Rightarrow$ **Taralı alan / the shaded area = ? $cm^2$**

A) $4\sqrt{3}$ B) $\frac{4\sqrt{3}}{3}$ C) $4(\sqrt{3}-1)$ D) $4(\sqrt{3}+1)$ E) $4(\sqrt{3}-2)$

**12.** |AF| = |FD|,

|BD| = |DC|

$\Rightarrow \dfrac{A(\widehat{AFC})}{A(\widehat{ABC})} = ?$

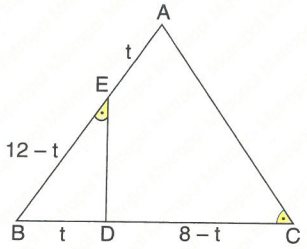



A) $\frac{1}{6}$ B) $\frac{1}{5}$ C) $\frac{1}{4}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | C | D | E | A | E | B | A | D | C | B | C |

**1.**

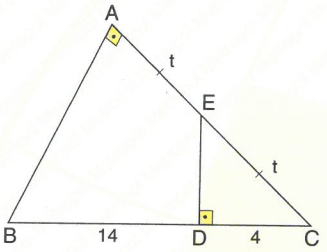



$\widehat{BDE} \sim \widehat{ABC} \Rightarrow \frac{|BD|}{|AB|} = \frac{|BE|}{|BC|}$

$\frac{t}{12} = \frac{12-t}{8} \Rightarrow t = 7{,}2$ cm

Yanıt / Answer **E**

**2.**



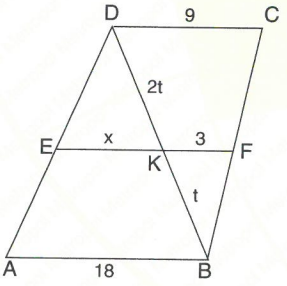

$\widehat{DEC} \sim \widehat{ABC}$

$\frac{t}{18} = \frac{4}{2t} \Rightarrow 2t^2 = 4 \cdot 18 \Rightarrow t = 6$ cm

$|AC| = 2t = 2 \cdot 6 = 12$ cm

Yanıt / Answer **C**

**3.**




$\widehat{BKF} \sim \widehat{BDC} \Rightarrow \frac{|BK|}{|BD|} = \frac{|KF|}{|DC|} = \frac{3}{9} = \frac{1}{3}$

$\widehat{DEK} \sim \widehat{DAB} \Rightarrow$

$\frac{|DK|}{|DB|} = \frac{|EK|}{|AB|} \Rightarrow \frac{2}{3} = \frac{x}{18} \Rightarrow x = 12$ cm

Yanıt / Answer **D**

**4.**

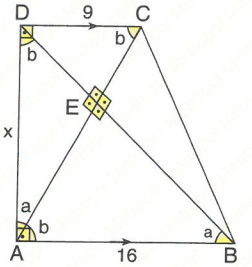
$\widehat{ADC} \sim \widehat{BAD}$

$\frac{|AB|}{|DA|} = \frac{|DA|}{|DC|}$

$\frac{16}{x} = \frac{x}{9}$

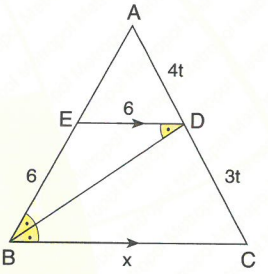
$x^2 = 144$

$x = 12$ cm




Yanıt / Answer **E**

**5.**




$ED \parallel BC \Rightarrow m(\widehat{EDB}) = m(\widehat{DBC})$

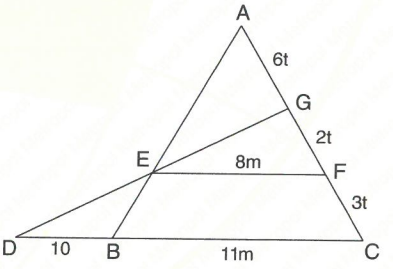
$|ED| = |EB| = 6$ cm

$\widehat{AED} \sim \widehat{ABC} \Rightarrow \frac{|AD|}{|AC|} = \frac{|ED|}{|BC|}$

$\frac{4}{7} = \frac{6}{x} \Rightarrow x = 10{,}5$ cm

Yanıt / Answer **A**

**6.**




$\widehat{AEF} \sim \widehat{ABC} \Rightarrow \frac{|EF|}{|BC|} = \frac{|AF|}{|AC|} = \frac{8}{11}$

$|EF| = 8m \Rightarrow |BC| = 11m$

$\widehat{GEF} \sim \widehat{GDC} \Rightarrow \frac{|EF|}{|DC|} = \frac{|GF|}{|GC|} = \frac{2}{5}$

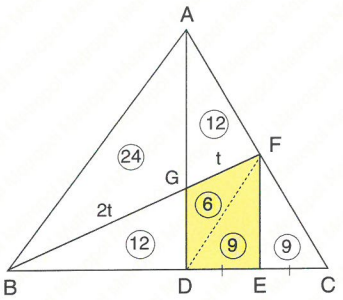
$|EF| = 8m \Rightarrow |DC| = 20m$

$|DC| = 10 + 11m = 20m \Rightarrow m = \frac{10}{9}$

$|EF| + |BC| = 8m + 11m = 19m = 19 \cdot \frac{10}{9} = \frac{190}{9}$

Yanıt / Answer **E**

**7.**

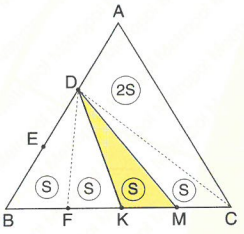



[FE] // [AD] ⇒ |DE| = |EC|

A(GDEF) = 15 cm$^2$

**Yanıt / Answer B**

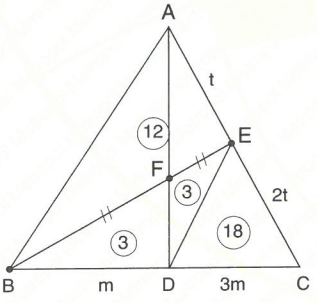
**8.**




$$\frac{A(\widehat{DKM})}{A(\widehat{ABC})} = \frac{S}{6S} = \frac{1}{6}$$

**Yanıt / Answer A**

**9.**

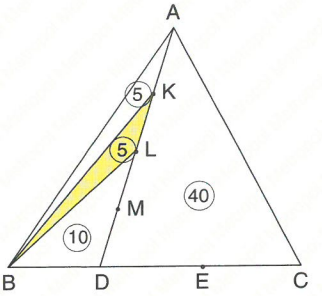



$$\frac{|AE|}{|AC|} = \frac{A(\widehat{ABE})}{A(\widehat{BEC})} = \frac{1}{2} \Rightarrow A(\widehat{ABE}) = 12 \text{ cm}^2$$

$A(\widehat{ABC}) = 24 + 12 = 36$ cm$^2$

**Yanıt / Answer D**

**10.**

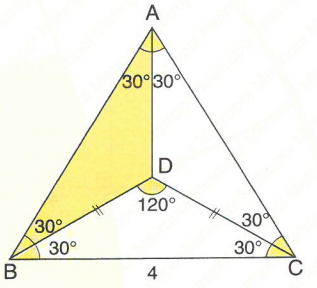



$$\frac{|KL|}{|AD|} = \frac{A(\widehat{BKL})}{A(\widehat{BAD})} = \frac{1}{4} \Rightarrow A(\widehat{ABD}) = 20$$

$$\frac{|BD|}{|BC|} = \frac{A(\widehat{ABD})}{A(\widehat{ABC})} = \frac{1}{3} \Rightarrow A(ABC) = 20 \cdot 3 = 60 \text{ cm}^2$$

**Yanıt / Answer C**

**11.**




$$A(\widehat{ABC}) = \frac{(4)^2 \cdot \sqrt{3}}{4} = 4\sqrt{3} \text{ cm}^2$$

D noktası ABC eşkenar üçgeninde ağırlık merkezidir.

The point D is center of the gravity in the equaliteral ABC triangle.

$$A(\widehat{BDA}) = \frac{A(\widehat{ABC})}{3} = \frac{4\sqrt{3}}{3} \text{ cm}^2$$

**Yanıt / Answer B**

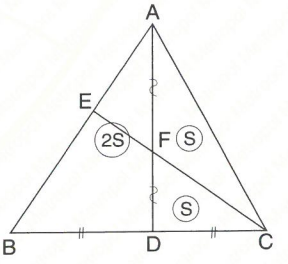
**12.** |AF| = |FD|

$A(\widehat{AFC}) = S \Rightarrow A(\widehat{FDC}) = S$

|BD| = |DC|

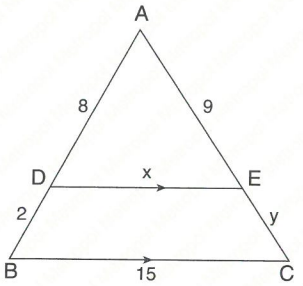
$A(\widehat{ADC}) = A(\widehat{ABD}) = 2S$

$$\frac{A(\widehat{AFC})}{A(\widehat{ABC})} = \frac{S}{4S} = \frac{1}{4}$$



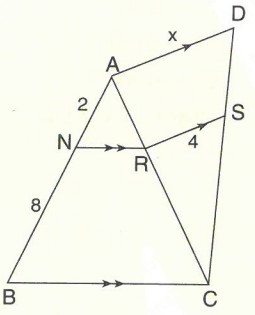

**Yanıt / Answer C**

**1.** [DE] // [BC],
IADI = 8 cm,
IDBI = 2 cm,
IAEI = 9 cm,
IBCI = 15 cm,
IDEI = x cm,
IECI = y cm
⇒ **x · y = ? cm**



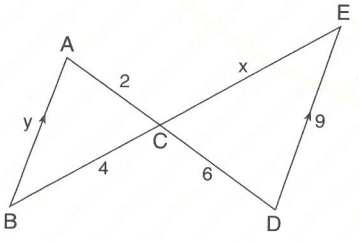

A) $\frac{33}{4}$ B) $\frac{37}{4}$ C) 23 D) 25 E) 27

**2.** [NR] // [BC],
[RS] // [AD],
IANI = 2 cm,
INBI = 8 cm,
IRSI = 4 cm
⇒ **IADI = x = ? cm**




A) 5 B) 6 C) 7 D) 8 E) 9

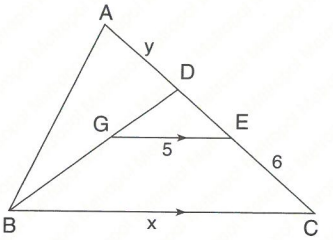
**3.**




[AB] // [DE], IACI = 2 cm, ICDI = 6 cm, IBCI = 4 cm,
IDEI = 9 cm, IABI = y, ICEI = x ⇒ **x + y = ?**

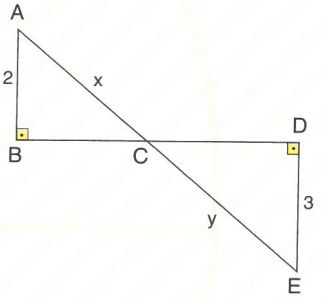
A) 12 B) 15 C) 18 D) 21 E) 24

**4.** G ağırlık merkezidir.
G is center of gravity.
[GE] // [BC],
IGEI = 5 cm,
IECI = 6 cm,
IBCI = x cm,
IADI = y cm
⇒ **x − y = ?**



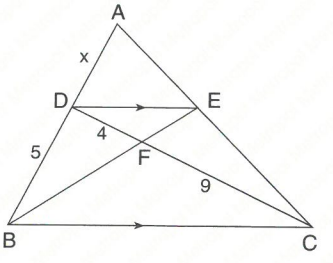

A) 4 B) 5 C) 6 D) 9 E) 12

**5.** [AB] ⊥ [BD],
[BD] ⊥ [DE],
IBDI = 12 cm,
IABI = 2 cm,
IDEI = 3 cm,
IACI = x cm,
ICEI = y cm
⇒ **x + y = ? cm**



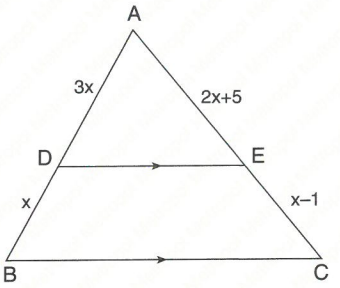

A) 13 B) 14 C) 15 D) 16 E) 17

**6.** [DE] // [BC],
IDFI = 4 cm,
IFCI = 9 cm,
IDBI = 5 cm
⇒ **IADI = x = ? cm**



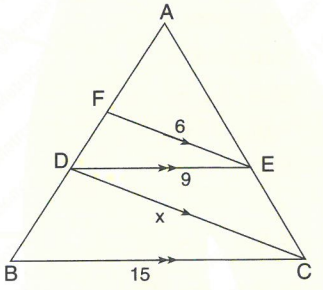

A) 3 B) 4 C) 5 D) 6 E) 7

**7.** [DE] // [BC],
IADI = 3x cm,
IDBI = x cm,
IAEI = (2x + 5) cm,
IECI = (x – 1) cm
⇒ **IDBI = x = ? cm**



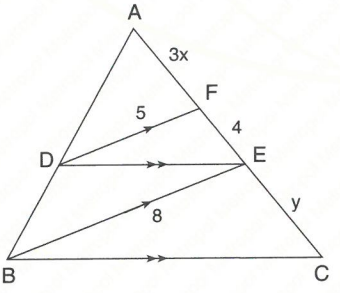

A) 4 B) 5 C) 6 D) 7 E) 8

**8.** [DE] // [BC],
[EF] // [DC],
IEFI = 6 cm,
IDEI = 9 cm,
IBCI = 15 cm
⇒ **IDCI = x = ? cm**



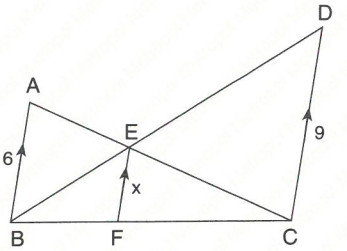

A) 9 B) 10 C) 11 D) 12 E) 13

**9.** [DE] // [BC],
[DF] // [BE],
IEFI = 4 cm,
IAFI = 3x cm,
IDFI = 5 cm,
IBEI = 8 cm
⇒ **IECI = y = ? cm**




A) $\frac{14}{3}$ B) $\frac{16}{3}$ C) $\frac{28}{5}$ D) $\frac{32}{5}$ E) $\frac{34}{5}$

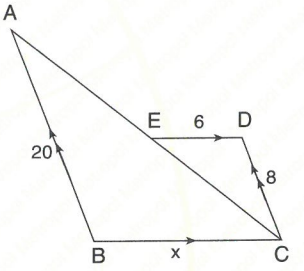
**10.**




[AB] // [EF] // [DC], IABI = 6 cm, IDCI = 9 cm
⇒ **IEFI = x = ? cm**

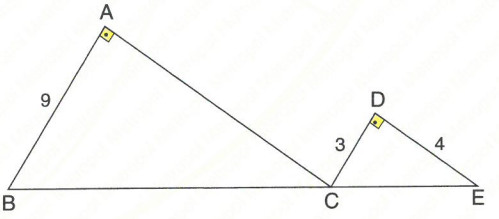
A) $\frac{18}{5}$ B) $\frac{21}{5}$ C) $\frac{24}{5}$ D) $\frac{13}{3}$ E) $\frac{16}{3}$

**11.** [AB] // [DC],
[ED] // [BC],
IDCI = 8 cm,
IABI = 20 cm,
IEDI = 6 cm
⇒ **IBCI = x = ? cm**




A) 12 B) 14 C) 15 D) 16 E) 18

**12.**



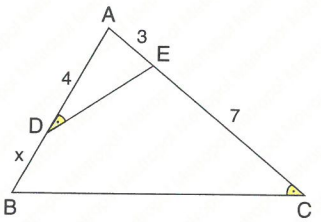

[AB] // [DC], [AB] ⊥ [AC] , [CD] ⊥ [DE], [DC]=3 cm,
IABI=9 cm, IDEI=4 cm ⇒ **IBEI = x = ? cm**

A) 15 B) 20 C) 25 D) 30 E) 35

**YANITLAR / ANSWERS**

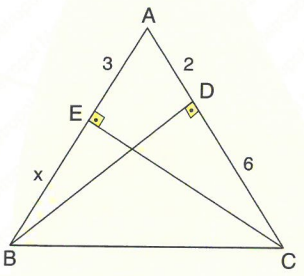
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | A | B | C | A | B | E | B | D | A | C | B |

**1.** $m(\widehat{ADE}) = m(\widehat{ACB})$,
$|AE| = 3$ cm,
$|EC| = 7$ cm,
$|AD| = 4$ cm
$\Rightarrow$ **$|DB| = x = ?$ cm**



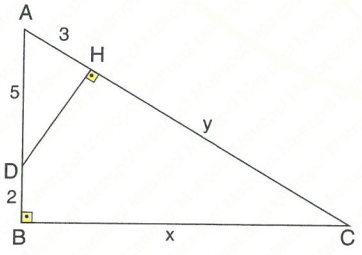

A) 3 B) $\frac{7}{2}$ C) 4 D) $\frac{9}{2}$ E) 5

**2.** $[AB] \perp [EC]$,
$[AC] \perp [BD]$,
$|AD| = 2$ cm,
$|AE| = 3$ cm,
$|DC| = 6$ cm
$\Rightarrow$ **$|EB| = x = ?$ cm**




A) $\frac{3}{2}$ B) 2 C) $\frac{5}{2}$ D) $\frac{7}{3}$ E) 3

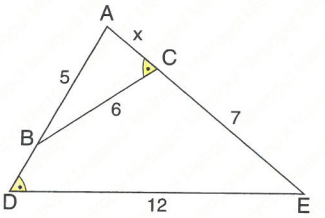
**3.**




$[AB] \perp [BC]$, $[DH] \perp [AC]$, $|AH| = 3$ cm, $|AD| = 5$ cm,
$|DB| = 2$ cm, $|BC| = x$, $|HC| = y \Rightarrow$ **$x + y = ?$**

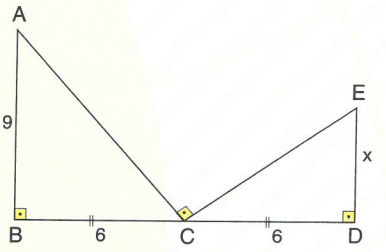
A) 14 B) 15 C) 16 D) 17 E) 18

**4.** $m(\widehat{ACB}) = m(\widehat{ADE})$,
$|AB| = 5$ cm,
$|EC| = 7$ cm,
$|BC| = 6$ cm,
$|DE| = 12$ cm
$\Rightarrow$ **$|AC| = x = ?$ cm**




A) 2 B) $\frac{5}{2}$ C) 3 D) $\frac{7}{2}$ E) 4

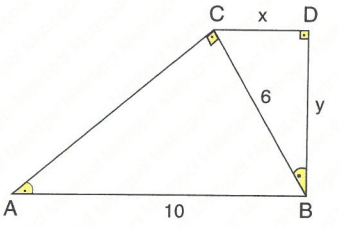
**5.**




$[AB] \perp [BD]$, $[BD] \perp [DE]$, $[AC] \perp [CE]$,
$|BC| = |CD| = 6$ cm, $|AB| = 9$ cm $\Rightarrow$ **$|DE| = ?$ cm**

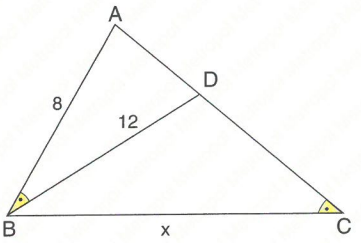
A) $\frac{5}{3}$ B) $\frac{7}{3}$ C) $\frac{5}{2}$ D) $\frac{7}{2}$ E) 4

**6.** $m(\widehat{CAB}) = m(\widehat{CBD})$,
$[AC] \perp [CB]$,
$[BD] \perp [CD]$,
$|CB| = 6$ cm,
$|AB| = 10$ cm,
$|CD| = x$ cm,
$|DB| = y$ cm
$\Rightarrow$ **$\frac{x}{y} = ?$**




A) $\frac{1}{2}$ B) $\frac{2}{3}$ C) $\frac{3}{4}$ D) $\frac{4}{5}$ E) $\frac{5}{6}$

**7.**

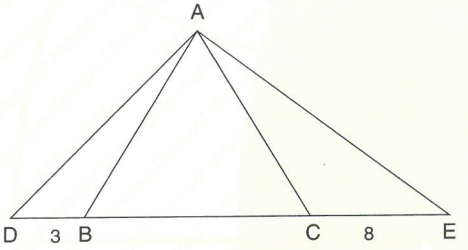



$m(\widehat{ABD}) = m(\widehat{ACB})$, $|AB| = 8$ cm, $|AC| = 18$ cm,

$|BD| = 12$ cm $\Rightarrow$ **$|BC| = x = ?$ cm**

A) 20 B) 22 C) 24 D) 25 E) 27

**8.**




$m(\widehat{DAE}) = 120°$, $|AB| = |BC| = |AC|$, $|DB| = 3$ cm,

$|CE| = 8$ cm $\Rightarrow$ **$A(\widehat{ABC}) = ?$ cm$^2$**

A) $5\sqrt{3}$ B) $6\sqrt{3}$ C) $7\sqrt{3}$ D) $8\sqrt{3}$ E) $9\sqrt{3}$

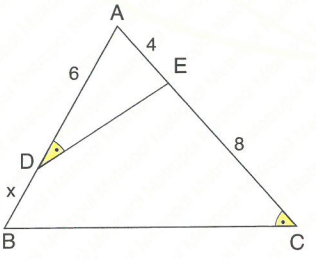
**9.** $m(\widehat{ADE}) = m(\widehat{ACB})$,

$|AE| = 4$ cm,

$|EC| = 8$ cm,

$|AD| = 6$ cm

$\Rightarrow$ **$|DB| = x = ?$ cm**




A) 1 B) $\frac{3}{2}$ C) 2 D) $\frac{5}{2}$ E) 3

**10.** $[EK] // [BC]$,

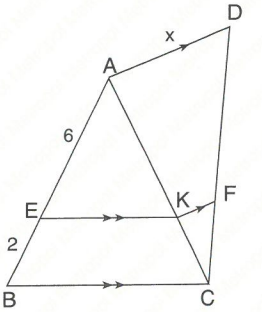
$[KF] // [AD]$,

$|KF| = \frac{3}{2}$ cm,

$|AE| = 6$ cm,

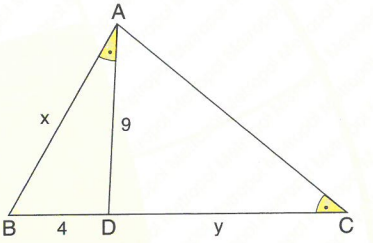
$|EB| = 2$ cm

$\Rightarrow$ **$|AD| = x = ?$ cm**




A) 6 B) $\frac{13}{2}$ C) 7 D) $\frac{15}{2}$ E) 8

**11.**




$x \in Z$, $m(\widehat{BAD}) = m(\widehat{ACD})$, $|AD| = 9$ cm, $|BD| = 4$ cm

max(x) için(for) $\Rightarrow$ **$y = ?$ cm**

A) 24 B) 26 C) 28 D) 30 E) 32

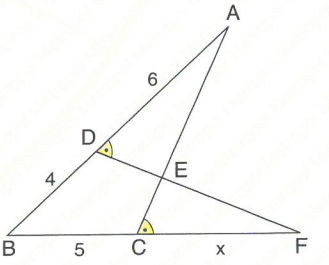
**12.** $m(\widehat{ADF}) = m(\widehat{ACF})$,

$|BD| = 4$ cm,

$|DA| = 6$ cm,

$|BC| = 5$ cm

$\Rightarrow$ **$|CF| = x = ?$ cm**

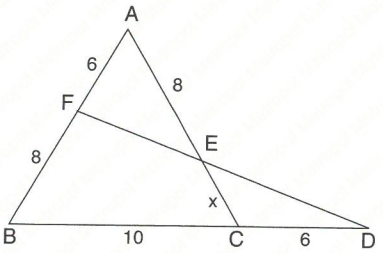



A) 3 B) $\frac{7}{2}$ C) 4 D) $\frac{9}{2}$ E) 5

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | D | E | C | E | C | E | B | C | A | E | A |

**1.**




IAFI = ICDI = 6 cm, IAEI = IFBI = 8 cm, IBCI = 10 cm

⇒ **IECI = x = ? cm**

A) 3 B) 4 C) 5 D) 6 E) 7

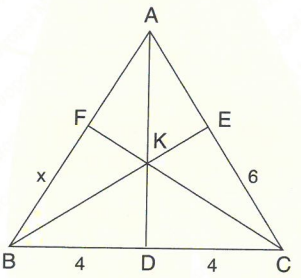
**2.** ABC, eşkenar üçgendir.

ABC is an equilateral triangle.

IBDI = IDCI = 4 cm,

ICEI = 6 cm

⇒ **IFBI = x = ? cm**




A) 3 B) 4 C) 5 D) 6 E) 7

**3.** [PD] ⊥ [BC],

[PE] ⊥ [AC],

[PF] ⊥ [AB],

IBDI = 4 cm,

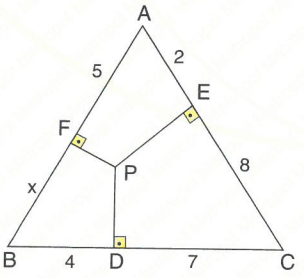
IDCI = 7 cm,

ICEI = 8 cm,

IAEI = 2 cm,

IAFI = 5 cm

⇒ **IFBI = x = ? cm**




A) $\sqrt{13}$ B) $\sqrt{17}$ C) $2\sqrt{13}$ D) $2\sqrt{17}$ E) $\sqrt{23}$

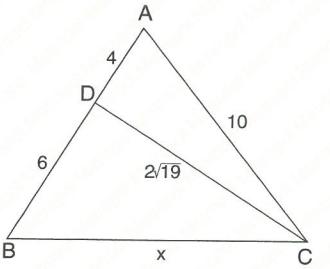
**4.** IADI = 4 cm,

IDBI = 6 cm,

IACI = 10 cm,

IDCI = $2\sqrt{19}$ cm

⇒ **IBCI = x = ? cm**




A) 7 B) 8 C) 9 D) 10 E) 12

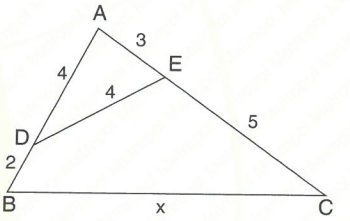
**5.** IADI = IDEI = 4 cm,

IAEI = 3 cm,

IDBI = 2 cm,

IECI = 5 cm

⇒ **IBCI = x = ? cm**




A) 6 B) 7 C) 8 D) 9 E) 10

**6.** m($\widehat{DAC}$) = m($\widehat{CAB}$),

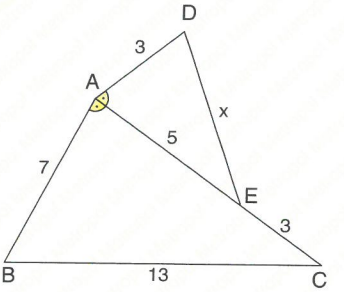
IADI = IECI = 3 cm,

IABI = 7 cm,

IAEI = 5 cm,

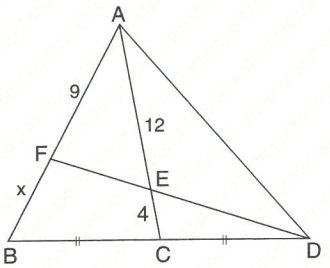
IBCI = 13 cm

⇒ **IDEI = x = ? cm**



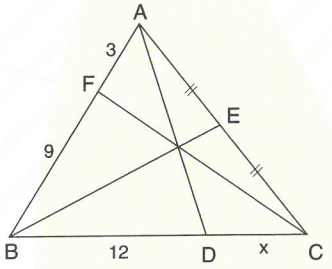

A) 4 B) 5 C) 6 D) 7 E) 8

**7.** IAFI = 9 cm,
IAEI = 12 cm,
IECI = 4 cm,
IBCI = ICDI
⇒ **IFBI = x = ? cm**



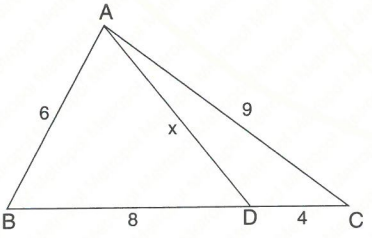

A) 5 B) 6 C) 7 D) 8 E) 9

**8.** IAEI = IECI,
IAFI = 3 cm,
IFBI = 9 cm
IBDI = 12 cm
⇒ **IDCI = x = ? cm**




A) 2 B) 3 C) 4 D) 5 E) 6

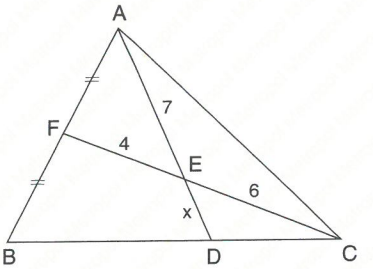
**9.**




IABI = 6 cm, IBDI = 8 cm, IDCI = 4 cm, IACI = 9 cm
⇒ **IADI = x = ? cm**

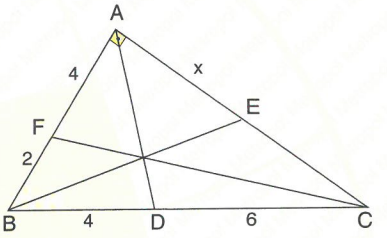
A) $\sqrt{17}$ B) $\sqrt{19}$ C) $\sqrt{21}$ D) $\sqrt{26}$ E) $\sqrt{34}$

**10.** IAFI = IFBI,
IAEI = 7 cm,
IECI = 6 cm,
IEFI = 4 cm
⇒ **IEDI = x = ? cm**




A) 1 B) $\frac{3}{2}$ C) 2 D) $\frac{5}{2}$ E) 3

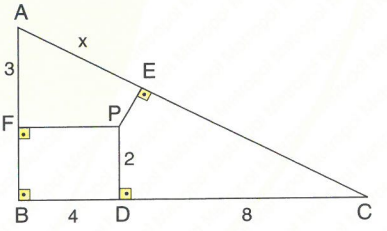
**11.**




[AB] ⊥ [AC], IAFI = IBDI = 4 cm, IFBI = 2 cm,
IDCI = 6 cm ⇒ **IAEI = x = ? cm**

A) $\frac{20}{7}$ B) $\frac{24}{7}$ C) $\frac{26}{7}$ D) $\frac{32}{7}$ E) $\frac{34}{7}$

**12.**



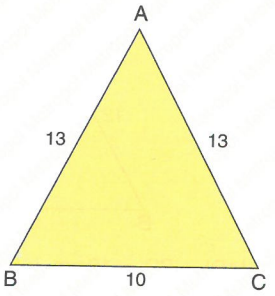

[AB] ⊥ [BC], [PD] ⊥ [BC], [PE] ⊥ [AC], [PF] ⊥ [AB],
IPDI = 2 cm, IBDI = 4 cm, IDCI = 8 cm
IAFI = 3 cm ⇒ **IAEI = x = ? cm**

A) $\frac{63}{13}$ B) $\frac{65}{17}$ C) $\frac{125}{26}$ D) $\frac{127}{26}$ E) $\frac{85}{13}$

**YANITLAR / ANSWERS**

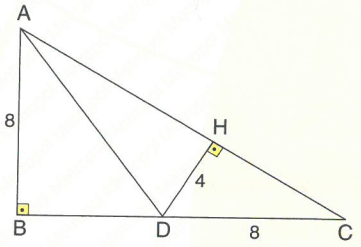
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | D | C | D | C | D | B | C | E | E | A | A |

**1.** $|AB| = |AC| = 13$ cm,
$|BC| = 10$ cm
$\Rightarrow$ **$A(\widehat{ABC}) = ?$ cm$^2$**




A) 45 B) 50 C) 55 D) 60 E) 65

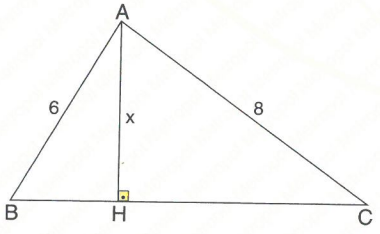
**2.**




$[AB] \perp [BC]$, $[DH] \perp [AC]$, $|AB| = |DC| = 8$ cm,
$|DH| = 4$ cm $\Rightarrow$ **$|AC| = x = ?$ cm**

A) 12 B) 14 C) 16 D) 18 E) 20

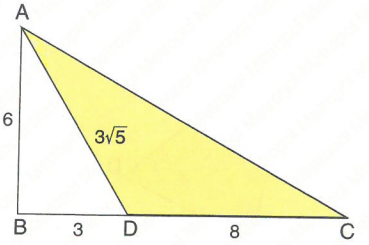
**3.**




$[AH] \perp [BC]$, $|AB| = 6$ cm, $|AC| = 8$ cm, $|BC| = 10$ cm
$|AH| = x = ?$ cm

A) 4,8 B) 5 C) 5,2 D) 5,4 E) 5,6

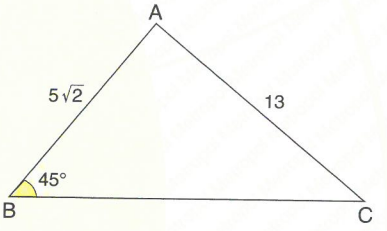
**4.**




$|AB| = 6$ cm, $|BD| = 3$ cm, $|AD| = 3\sqrt{5}$ cm, $|DC| = 8$ cm
$\Rightarrow$ **$A(\widehat{ADC}) = ?$ cm$^2$**

A) 18 B) 24 C) 32 D) 36 E) 48

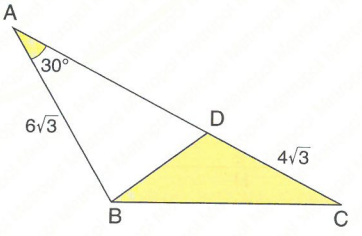
**5.**




$m(\widehat{ABC}) = 45°$, $|AB| = 5\sqrt{2}$, $|AC| = 13$ cm
$\Rightarrow$ **$A(\widehat{ABC}) = ?$ cm$^2$**

A) $\frac{75}{2}$ B) 40 C) $\frac{85}{2}$ D) 45 E) $\frac{95}{2}$

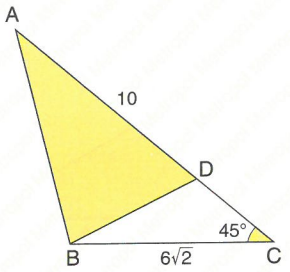
**6.**




$m(\widehat{BAD}) = 30°$, $|AB| = 6\sqrt{3}$, $|DC| = 4\sqrt{3}$ cm
$\Rightarrow$ **$A(\widehat{BCD}) = ?$ cm$^2$**

A) 12 B) 18 C) 24 D) 36 E) 48

**7.**

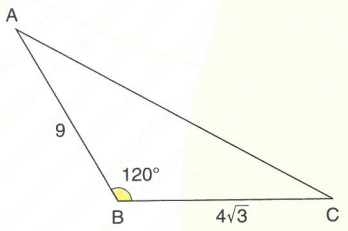



$m(\widehat{ACB}) = 45°$, $|AD| = 10$ cm, $|BC| = 6\sqrt{2}$ cm

$\Rightarrow$ **$A(\widehat{ABD}) = ?\ cm^2$**

A) 15 B) 20 C) 25 D) 30 E) 35

**8.**

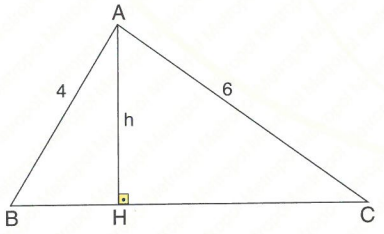



$m(\widehat{ABC}) = 120°$, $|AB| = 9$ cm, $|BC| = 4\sqrt{3}$ cm

$\Rightarrow$ **$A(\widehat{ABC}) = ?\ cm^2$**

A) 18 B) 27 C) $18\sqrt{3}$ D) 36 E) $27\sqrt{3}$

**9.**

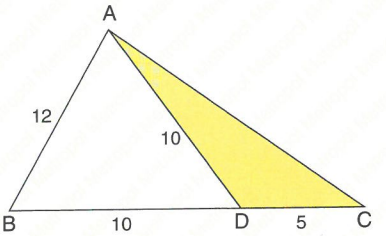



$|AB| = 4$ cm, $|BC| = 8$ cm, $|AC| = 6$ cm

$\Rightarrow$ **$|AH| = h = ?$**

A) $\frac{\sqrt{15}}{2}$ B) $\frac{2\sqrt{15}}{3}$ C) $\frac{3\sqrt{15}}{4}$ D) $\frac{3\sqrt{15}}{2}$ E) $\sqrt{15}$

**10.**

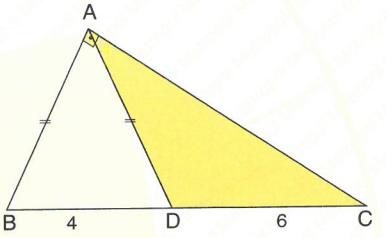



$|AD| = |BD| = 10$ cm, $|AB| = 12$ cm, $|DC| = 5$ cm

$\Rightarrow$ **$A(\widehat{ADC}) = ?\ cm^2$**

A) 12 B) 18 C) 24 D) 36 E) 48

**11.**




$[AB] \perp [AC]$, $|AB| = |AD|$, $|BD| = 4$ cm, $|DC| = 6$ cm

$\Rightarrow$ **$A(\widehat{ADC}) = ?\ cm^2$**

A) 12 B) 14 C) 16 D) 18 E) 20

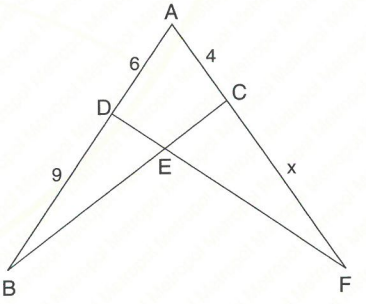
**12.** $A(\widehat{BDE}) = A(\widehat{ECF})$,

$|AD| = 6$ cm,

$|DB| = 9$ cm,

$|AC| = 4$ cm

$\Rightarrow$ **$|CF| = x = ?$ cm**

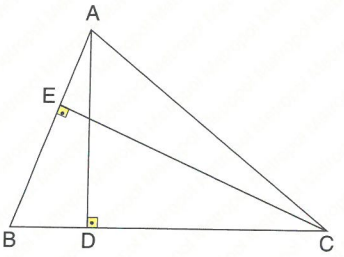



A) 5 B) 6 C) 7 D) 8 E) 9

**YANITLAR / ANSWERS**

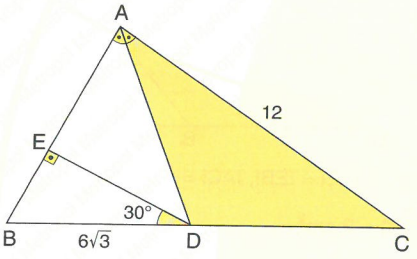
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | C | A | B | C | B | D | B | C | C | A | B |

**1.** [CE] ⊥ [AB],
[AD] ⊥ [BC],
IBCI = 10 cm,
IECI = 8 cm,
IADI = 6 cm
⇒ **IABI = ? cm**




A) $\frac{13}{2}$ B) 7 C) $\frac{15}{2}$ D) 8 E) 9

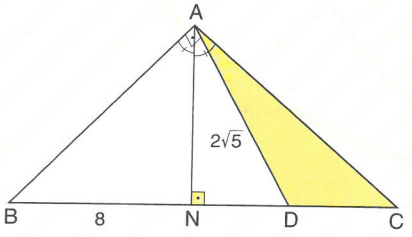
**2.**




$m(\widehat{EDB}) = 30°$, $m(\widehat{BAD}) = m(\widehat{DAC})$, [DE] ⊥ [AB],
IACI = 12 cm, IBDI = $6\sqrt{3}$ cm ⇒ **$A(\widehat{ADC})$ = ? cm²**

A) 44 B) 48 C) 52 D) 54 E) 60

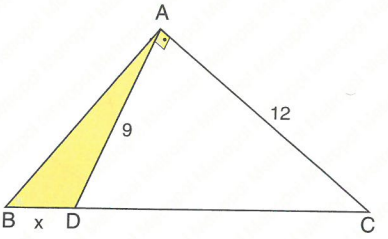
**3.**




[BA] ⊥ [AD], [AN] ⊥ [BC], $m(\widehat{BAN}) = m(\widehat{NAC})$,
IBNI = 8 cm, IADI = $2\sqrt{5}$ cm
⇒ **$A(\widehat{ADC})$ = ? cm²**

A) $3\sqrt{3}$ B) 12 C) 16 D) $6\sqrt{3}$ E) $8\sqrt{2}$

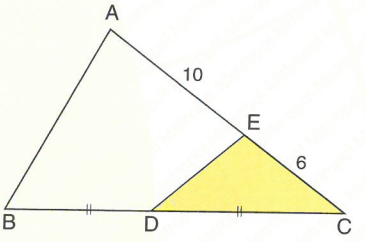
**4.**




[AD] ⊥ [AC], IADI = 9 cm, IACI = 12 cm,
$A(\widehat{ADB})$ = 18 cm²
⇒ **IBDI = x = ? cm**

A) 2 B) 3 C) 4 D) 5 E) 6

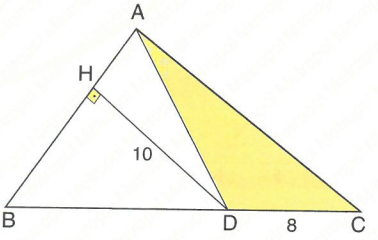
**5.**




IBDI = IDCI, $A(\widehat{ABC})$ = 112 cm², IAEI = 10 cm,
IECI = 6 cm ⇒ **$A(\widehat{DEC})$ = ? cm²**

A) 15 B) 16 C) 18 D) 20 E) 21

**6.**




[DH] ⊥ [AB], IABI = IBDI, IDHI = 10 cm, IDCI = 8 cm
⇒ **$A(\widehat{ADC})$ = ? cm²**

A) 32 B) 36 C) 40 D) 46 E) 48

**7.** $[DH] \perp [AB]$,

$m(\widehat{ABD}) = m(\widehat{DBC})$,

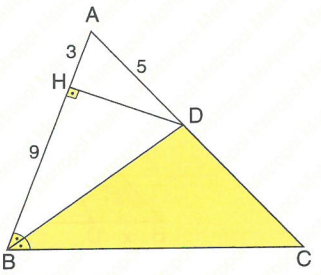
$|AH| = 3$ cm,

$|HB| = 9$ cm,

$|AD| = 5$ cm,

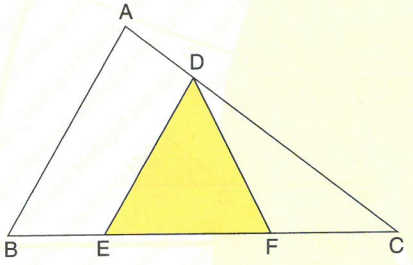
$\frac{|AD|}{|DC|} = \frac{2}{3}$

$\Rightarrow$ **$A(\widehat{BCD}) = ?$ cm$^2$**




A) 28 B) 30 C) 32 D) 34 E) 36

**8.**

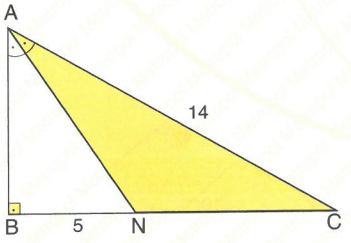



$3 \cdot |EF| = |BC|$, $4 \cdot |AD| = |DC|$, $A(\widehat{DEF}) = 8$ cm$^2$

$\Rightarrow$ **$A(\widehat{ABC}) = ?$ cm$^2$**

A) 24 B) 26 C) 28 D) 30 E) 32

**9.**



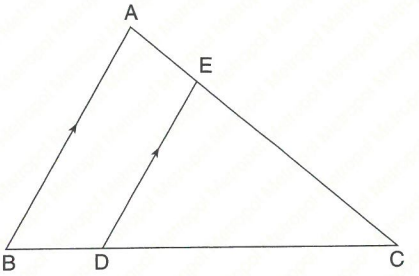

$m(\widehat{BAN}) = m(\widehat{NAC})$, $[AB] \perp [BC]$, $|BN| = 5$ cm,

$|AC| = 14$ cm

$\Rightarrow$ **$A(\widehat{ANC}) = ?$ cm$^2$**

A) 25 B) 28 C) 35 D) 36 E) 42

**10.**

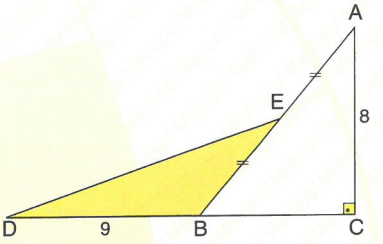



$[AB] // [DE]$, $\frac{|ED|}{|AB|} = \frac{4}{5}$, $A(\widehat{CED}) + A(\widehat{CAB}) = 82$ cm$^2$

$\Rightarrow$ **$A(\widehat{CED}) = ?$ cm$^2$**

A) 16 B) 20 C) 24 D) 28 E) 32

**11.**

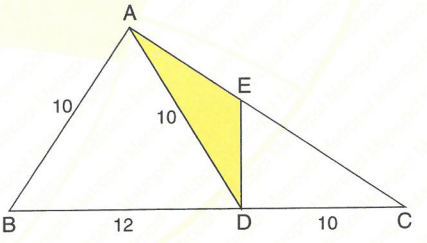



$[AC] \perp [BC]$, $|AE| = |EB|$, $|AC| = 8$ cm, $|DB| = 9$ cm

$\Rightarrow$ **$A(\widehat{EDB}) = ?$ cm$^2$**

A) 16 B) 18 C) 20 D) 28 E) 36

**12.**




$3 \cdot |AE| = 2 \cdot |EC|$, $|AB| = |AD| = |DC| = 10$ cm,

$|BD| = 12$ cm

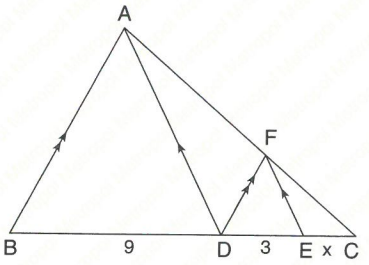
$\Rightarrow$ **$A(\widehat{ADE}) = ?$ cm$^2$**

A) 16 B) 20 C) 24 D) 32 E) 36

**YANITLAR / ANSWERS**

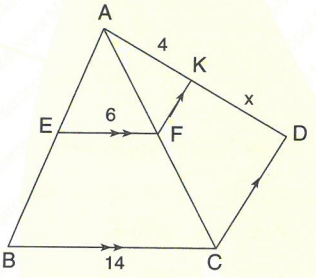
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | D | B | D | E | C | E | D | C | E | B | A |

**1.** [AB] // [DF],
[AD] // [EF],
IDEI = 3 cm,
IBDI = 9 cm
⇒ **IECI = x = ? cm**



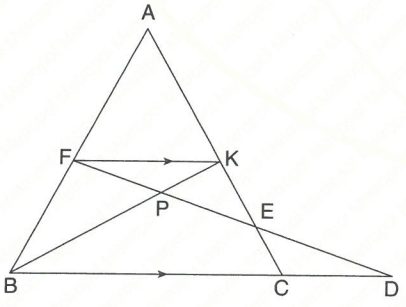

A) 1 B) $\frac{3}{2}$ C) 2 D) $\frac{5}{2}$ E) 3

**2.** [EF] // [BC],
[FK] // [CD],
IEFI = 6 cm,
IBCI = 14 cm,
IAKI = 4 cm
⇒ **IKDI = x = ? cm**




A) $\frac{7}{2}$ B) $\frac{14}{3}$ C) 5 D) $\frac{16}{3}$ E) 6

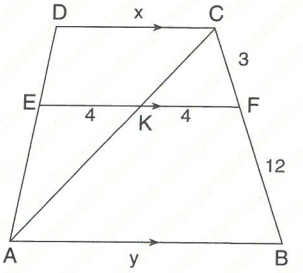
**3.**




[FK] // [BD], IAKI = IKCI, IKEI = IECI ⇒ $\frac{\text{IEPI}}{\text{IEDI}}$ = ?

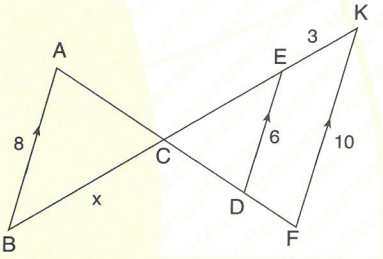
A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) $\frac{2}{3}$ E) $\frac{3}{4}$

**4.** [DC] // [EF] // [AB],
IKFI = IEKI = 4 cm,
ICFI = 3 cm,
IFBI = 12 cm,
IABI = y cm,
IDCI = x cm
⇒ **x + y = ? cm**




A) 20 B) 21 C) 22 D) 24 E) 25

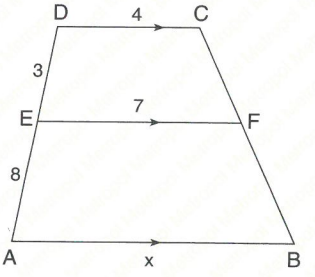
**5.**




[AB] // [DE] // [KF], IEDI = 6 cm, IKFI = 10 cm,
IEKI = 3 cm, IABI = 8 cm
⇒ **IBCI = x = ? cm**

A) 5 B) 6 C) 7 D) 8 E) 9

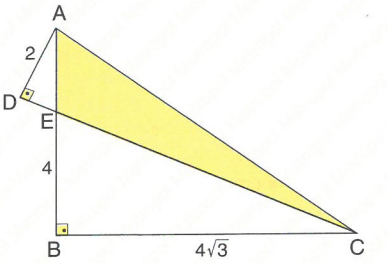
**6.** [AB] // [EF] // [DC],
IDCI = 4 cm,
IEFI = 7 cm,
IDEI = 3 cm,
IEAI = 8 cm
⇒ **IABI = x = ? cm**




A) 12 B) 13 C) 14 D) 15 E) 16

**7.** [AD] ⊥ [DC],
[AB] ⊥ [BC],
IADI = 2 cm,
IEBI = 4 cm,
IBCI = $4\sqrt{3}$ cm

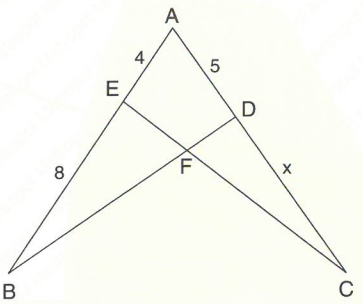
⇒ **A($\widehat{AEC}$) = ? cm²**




A) 6 B) 8 C) 12 D) $6\sqrt{3}$ E) $8\sqrt{3}$

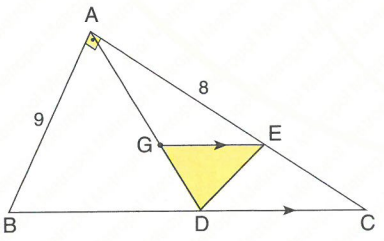
**8.** A($\widehat{EBF}$) = A($\widehat{DFC}$),
IAEI = 4 cm,
IEBI = 8 cm,
IADI = 5 cm

⇒ **IDCI = x = ? cm**




A) 6 B) 7 C) 8 D) 9 E) 10

**9.**



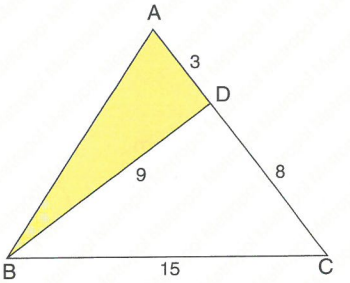

G ağırlık merkezidir. / G is center of gravity.
[AB] ⊥ [AC], [GE] // [DC], IABI = 9 cm, IAEI = 8 cm

⇒ **A($\widehat{GED}$) = ? cm²**

A) 6 B) 8 C) 9 D) 12 E) 15

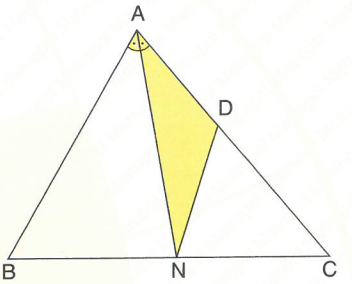
**10.** IADI = 3 cm,
IDBI = 9 cm,
IDCI = 8 cm,
IBCI = 15 cm

⇒ **A($\widehat{ABD}$) = ? cm²**




A) $3\sqrt{5}$ B) $3\sqrt{6}$ C) $3\sqrt{7}$ D) $3\sqrt{10}$ E) $3\sqrt{14}$

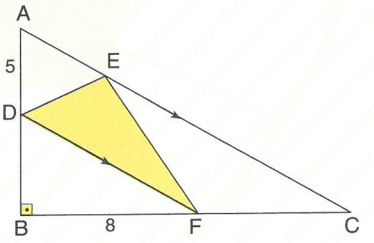
**11.**




m($\widehat{BAN}$) = m($\widehat{NAC}$), IABI = 2·IADI, 5·IADI = 3·IDCI,
A($\widehat{ABC}$) = 56 br²(u²) ⇒ **A($\widehat{AND}$) = ? cm²**

A) 6 B) 8 C) 12 D) 16 E) 18

**12.**




[AB] ⊥ [BC], [AC] // [DF], IADI = 5 cm, IBFI = 8 cm

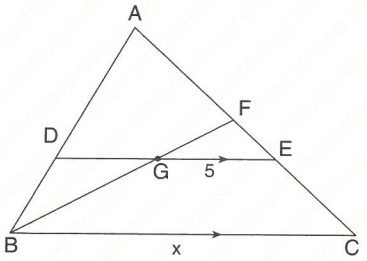
⇒ **A($\widehat{DEF}$) = ? cm²**

A) 20 B) 25 C) 30 D) 35 E) 40

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | D | C | E | B | D | B | E | A | E | C | A |

1.



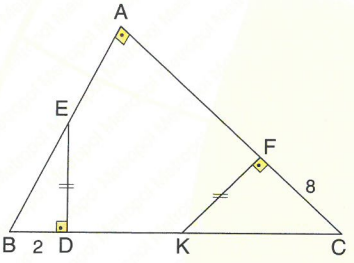

G ağırlık merkezidir. / G is center of gravity.

[DE] // [BC], IEGI = 5 cm

⇒ **IBCI = x = ? cm**

A) 10 B) 12 C) 15 D) 18 E) 20

2.



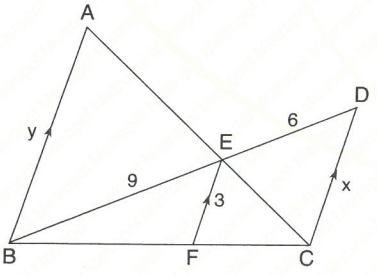

[AB] ⊥ [AC], [ED] ⊥ [BD], [FK] ⊥ [AC], IEDI = IFKI,

IBDI = 2 cm, IFCI = 8 cm

⇒ $\frac{|EB|}{|KC|} = ?$

A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) $\frac{2}{3}$ E) $\frac{3}{4}$

3.



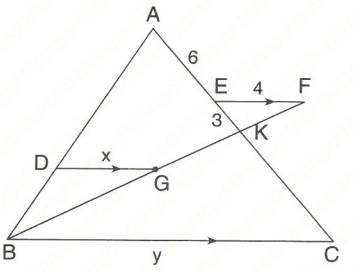

[AB] // [EF] // [DC], IBEI = 9 cm, IEDI = 6 cm,

IEFI = 3 cm, IDCI = x, IABI = y

⇒ **x + y = ?**

A) $\frac{17}{2}$ B) $\frac{20}{3}$ C) 10 D) $\frac{25}{2}$ E) 15

4.




G ağırlık merkezidir. / G is center of gravity.

[EF] // [DG] // [BC], IEFI = 4 cm, IAEI = 6 cm,

IEKI = 3 cm, IDGI = x cm, IBCI = y cm

⇒ **x + y = ?**

A) 12 B) 13 C) 14 D) 15 E) 16

5. [DE] // [BC],

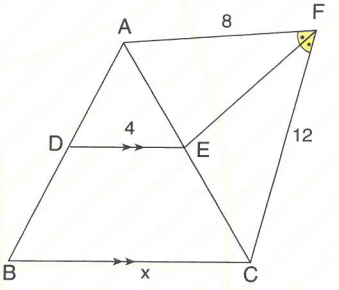
$m(\widehat{AFE}) = m(\widehat{EFC})$,

IDEI = 4 cm,

IAFI = 8 cm,

IFCI = 12 cm

⇒ **IBCI = x = ? cm**




A) 8 B) 9 C) 10 D) 12 E) 14

6. $d_1$ // $d_2$ // $d_3$ // $d_4$,

IABI = 2 cm,

IBCI = 3 cm,

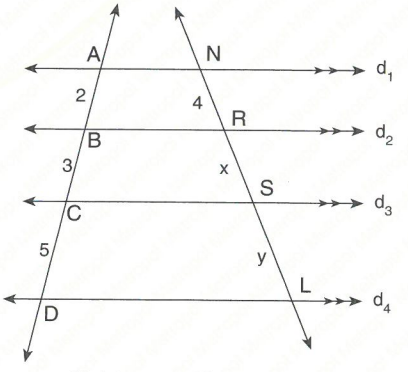
ICDI = 5 cm,

INRI = 4 cm,

IRSI = x cm,

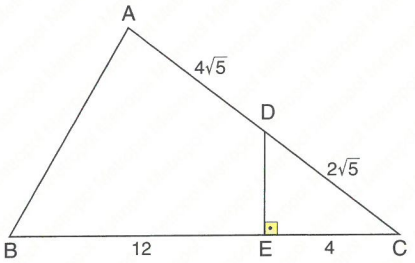
ISLI = y

⇒ **x + y = ?**




A) 10 B) 12 C) 14 D) 16 E) 18

**7.**



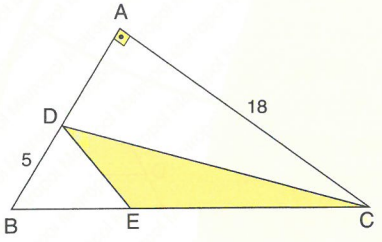

[DE] ⊥ [BC], IECI = 4 cm, IDCI = $2\sqrt{5}$ cm,

IADI = $4\sqrt{5}$ cm, IBEI = 12 cm

⇒ **A($\widehat{ABC}$) = ? cm²**

A) 24 B) 30 C) 36 D) 48 E) 52

**8.**



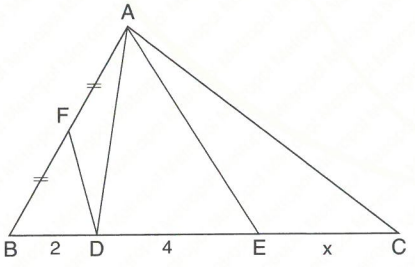

[AB] ⊥ [AC], IECI = 2·IBEI, IACI = 18 cm,

IBDI = 5 cm

⇒ **A($\widehat{EDC}$) = ? cm²**

A) 30 B) 36 C) 40 D) 45 E) 48

**9.**



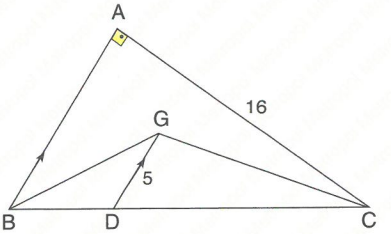

IAFI = IFBI, A($\widehat{AFD}$) = 6 br²(u²), IBDI = 2 cm,

IDEI = 4 cm, A($\widehat{AEC}$) = 30 br²(u²)

⇒ **IECI = x = ? cm**

A) 4 B) 5 C) 6 D) 7 E) 8

**10.**



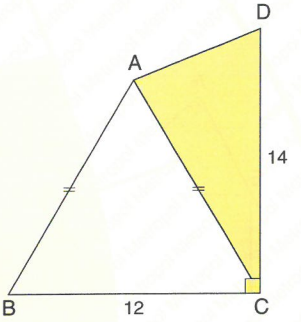

G ağırlık merkezidir. / G is center of gravity.

[AB] ⊥ [AC], [DE] // [AB], IACI = 16 cm, IEDI = 5 cm

⇒ **A($\widehat{GBC}$) = ? cm²**

A) 24 B) 36 C) 40 D) 60 E) 80

**11.**

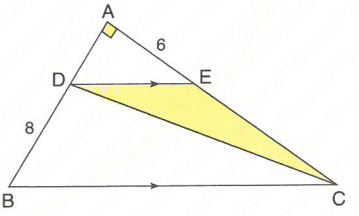



[DC] ⊥ [BC], IABI = IACI, IBCI = 12 cm, IDCI = 14 cm

⇒ **A($\widehat{ACD}$) = ? cm²**

A) 28 B) 32 C) 36 D) 42 E) 48

**12.**




[AB] ⊥ [AC], [DE] // [BC], IAEI = 6 cm, IDBI = 8 cm

⇒ **A($\widehat{DEC}$) = ? cm²**

A) 24 B) 28 C) 32 D) 36 E) 48

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | C | D | E | C | D | D | A | B | C | D | A |

# BÖLÜM CHAPTER 6

## TARİHSEL NOT / HISTORICAL NOTE

### İskenderiyeli Menelaus [70 – 140]

Yunan matematikçi ve gök bilimcidir. "Sphaerica'nın Arapça çevirisi" Menelaus'un günümüze kalan tek yapıtıdır. Üç kitaptan oluşan bu çalışma, kürenin geometrisi ve gök bilimsel hesaplamalarda kullanımını konu almaktadır. Kitap, küresel üçgen kavramına giriş yapmakta ve Menelaus teoreminin kanıtına yer vermektedir.

Greek mathematician and astronomer. "Sphaerica's Arabic translation" is Menelaus's only preserved work. This work, which consists of three books, deals with the use of sphere geometry and its use in astronomical calculations. The book introduces the concept of spheral triangle and places it as the evidence of the Menelaus theorem.

# ÜÇGENDE AÇI - KENAR BAĞINTILARI
# ANGLE - SIDE RELATIONS in TRIANGLE

**Bu bölüm 24 çözümlü test sorusu ve 12 test sorusu içermektedir.**

**This chapter includes 24 test questions with solutions and 12 test questions.**

**BÖLÜM / CHAPTER 6**

**ÜÇGENDE AÇI - KENAR BAĞINTILARI / ANGLE - SIDE RELATIONS in a TRIANGLE**

# ÜÇGENDE AÇI - KENAR BAĞINTILARI
# ANGLE-SIDE RELATIONS in TRIANGLE



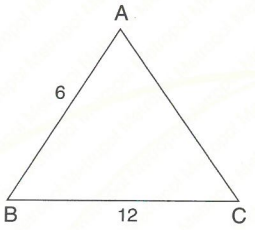
**1.** $|AB|, |BC|, |AC| \in Z$

$|AB| = 6$ cm,

$|BC| = 12$ cm,

$m(\widehat{C}) < m(\widehat{A}) < m(\widehat{B})$

$\Rightarrow$ **max(|AB|+|BC|+|AC|) = ?**



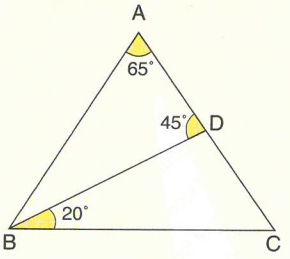

A) 25 B) 27 C) 30 D) 32 E) 35

**2.** $m(\widehat{BAD}) = 65°$,

$m(\widehat{ADB}) = 45°$,

$m(\widehat{DBC}) = 20°$

$\Rightarrow$ **? < ?**




A) $|AD| < |BA|$ B) $|BD| < |DC|$ C) $|AB| < |BC|$

D) $|AD| < |BD|$ E) $|BC| < |BD|$

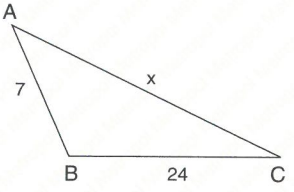
**3.** $|AB| = 7$ cm,

$|BC| = 24$ cm,

$m(\widehat{ABC}) > 90°$,

$x \in Z$

$\Rightarrow$ **min(x) + max(x) = ?**



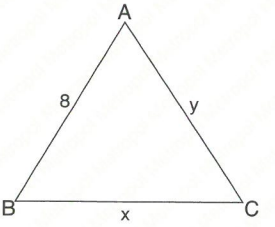

A) 56 B) 50 C) 40 D) 30 E) 25

**4.** $x, y \in Z$,

$|AB| = 8$ cm,

$m(\widehat{B}) < m(\widehat{C})$

$\Rightarrow$ **max(x + y) = ? cm**




A) 18 B) 19 C) 20 D) 21 E) 22

**5.** $|AB| = a$ cm,

$|AC| = b$ cm,

$|CD| = c$ cm,

$|BC| = f$ cm,

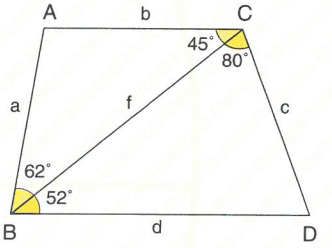
$m(\widehat{ABC}) = 62°$,

$m(\widehat{ACB}) = 45°$,

$m(\widehat{CBD}) = 52°$,

$m(\widehat{BCD}) = 80°$

$\Rightarrow$ **? < ? < ? < ? < ?**




A) c > d > f > b > a B) d > c > f > b > a

C) f > d > c > b > a D) f > c > d > b > a

E) d > c > f > a > b

**6.** $|AB| = 4$ cm,

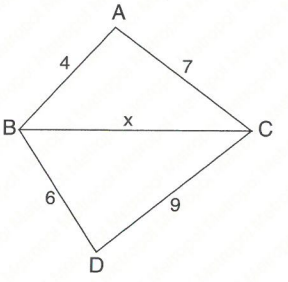
$|AC| = 7$ cm,

$|BD| = 6$ cm,

$|DC| = 9$ cm,

$|BC| = x$ cm

$\Rightarrow \sum$ **x = ? cm**




A) 25 B) 36 C) 43 D) 49 E) 54

**7.** $x \in Z$,

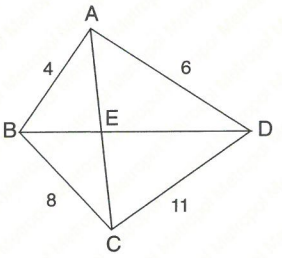
$|AB| = 4$ cm,

$|AD| = 6$ cm,

$|BC| = 8$ cm,

$|CD| = 11$ cm

$\Rightarrow$ **max(|AC| + |BD|) = ? cm**

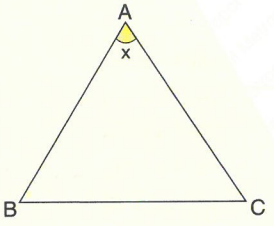



A) 15 B) 17 C) 19 D) 21 E) 23

**8.** $|AB| = |AC|$,

$44 < m(\widehat{B}) < 66$

$\Rightarrow$ **? < x < ?**

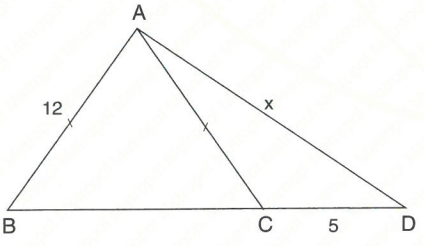



A) $44 < x < 92$ B) $48 < x < 92$

C) $48 < x < 60$ D) $42 < x < 80$

E) $46 < x < 92$

**9.**




$|AB| = |AC| = 12$ cm, $|CD| = 5$ cm,

$|AD| = x \in Z$

$\Rightarrow$ **min(x) = ?**

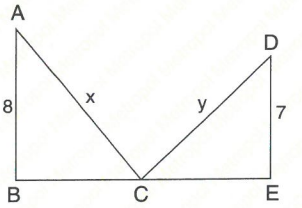
A) 8 B) 12 C) 13 D) 14 E) 15

**10.** $|AB| = 8$ cm,

$|DE| = 7$ cm,

$|BE| = 12$ cm

$\Rightarrow$ **min(x + y) = ? cm**




A) 4 B) 6 C) 8 D) 10 E) 12

**11.** $x \in Z$,

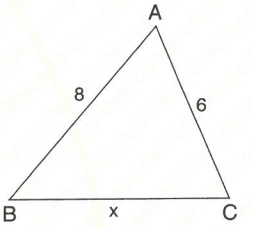
$|AB| = 8$ cm,

$m(\widehat{BAC}) < 90°$,

$|AC| = 6$ cm,

$|BC| = x$ cm

$\Rightarrow$ **$\sum x$ = ? cm**

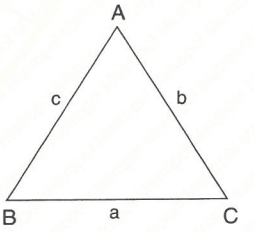



A) 34 B) 36 C) 42 D) 45 E) 50

**12.** $a, b, c \in Z$,

$a + b + c = 45$

$\Rightarrow$ **max(a) = ? cm**

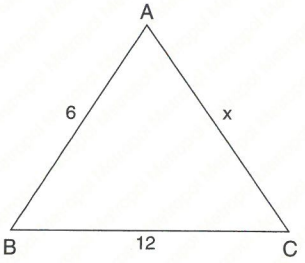



A) 17 B) 19 C) 22 D) 25 E) 27

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | C | A | D | B | D | D | B | D | A | C | C |

**1.**




$m(\widehat{C}) < m(\widehat{A}) < m(\widehat{B})$

$\Rightarrow 6 < 12 < x \ldots (1)$

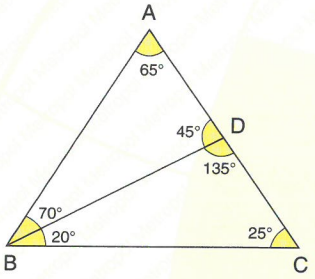
$6 < x < 18 \ldots (2)$

$\Big\} 12 < x < 18$

$\max(|AB| + |AC| + |CB|) = 6 + 12 + 17 = 35$ cm

**Yanıt / Answer E**

**2.**



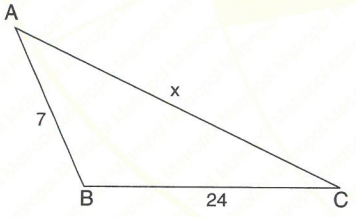

$m(\widehat{BAC}) = 65° > m(\widehat{ACB}) = 25°$

$\Rightarrow |BC| > |AB|$

$|AB| < |BC|$

**Yanıt / Answer C**

**3.**




$m(ABC) > 90° \Rightarrow x^2 > 7^2 + 24^2$

$x > 25 \ldots (1)$

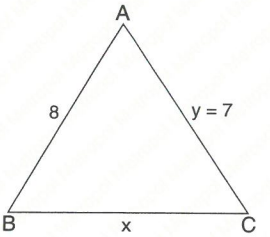
$17 < x < 31 \ldots (2)$

$25 < x < 31$

$\Rightarrow \min(x) + \max(x) = 26 + 30 = 56$

**Yanıt / Answer A**

**4.**




$m(\widehat{B}) < m(\widehat{C})$

$\Rightarrow y < 8$

$\max(y) = 7$ cm, $y \in Z$

$1 < x < 15$

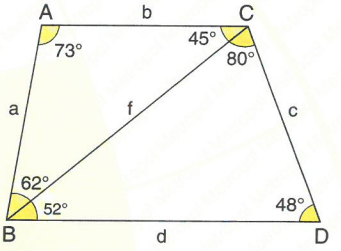
$\max(x) = 14$ cm, $x \in Z$

$\max(x + y) = 7 + 14$

$= 21$ cm

**Yanıt / Answer D**

**5.**




$m(\widehat{ACB}) < m(\widehat{ABC}) < m(\widehat{BAC})$

$\Rightarrow a < b < f \ldots (1)$

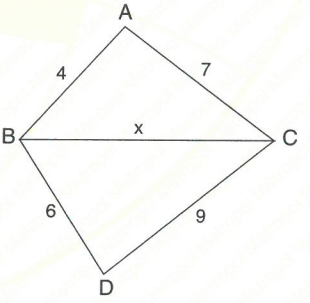
$m(\widehat{BDC}) < m(\widehat{DBC}) < m(\widehat{DCB})$

$\Rightarrow f < c < d \ldots (2)$

$a < b < f < c < d$

**Yanıt / Answer B**

**6.**




$3 < x < 11 \ldots (1)$

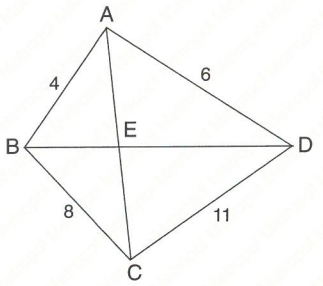
$3 < x < 15 \ldots (2)$

$\Big\} 3 < x < 11$

$\sum x = 4 + 5 + 6 + 7 + 8 + 9 + 10 = 49$ cm

**Yanıt / Answer D**

**7.**




$4 < |AC| < 12 \ldots (1)$
$5 < |AC| < 17 \ldots (2)$ $\Big\}\ 5 < |AC| < 12$

$2 < |BD| < 10 \ldots (1)$
$3 < |BD| < 19 \ldots (2)$ $\Big\}\ 3 < |BD| < 10$

$5 < |BD| < 12$
$+\ 3 < |AC| < 10$

$8 < |AC| + |BD| < 22$

$\max(|AC| + |BD|) = 21\text{cm}$

**Yanıt / Answer D**

**8.**

$44 < a < 66$

$88 < 2a < 132 \ldots (1)$

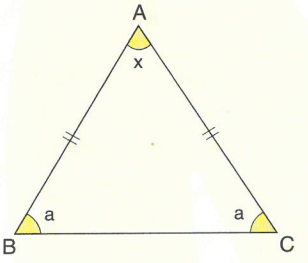
$x + 2a = 180$

$2a = 180 - x$

$88 < 180 - x < 132$

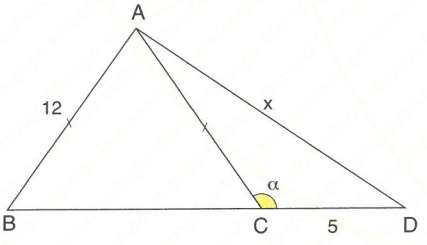
$-92 < -x < -48$

$48 < x < 92$




**Yanıt / Answer B**

**9.**




$|AB| = |AC| \Rightarrow m(\widehat{ACB}) < 90°$

$m(\widehat{ACB}) < 90° \Rightarrow \alpha > 90°$

$|AD|^2 > |AC|^2 + |CD|^2$ Pisagor [ *Pythagor* ]

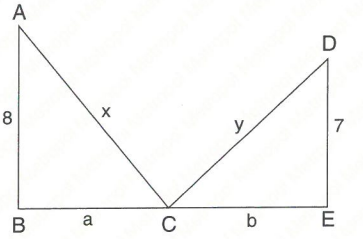
$|AD|^2 > 12^2 + 5^2$

$|AD| = x > 13$

$x \in Z \Rightarrow \min(x) = 14$ cm

**Yanıt / Answer D**

**10.**




$8 - a < x < 8 + a$
$+\ 7 - b < y < 7 - b$

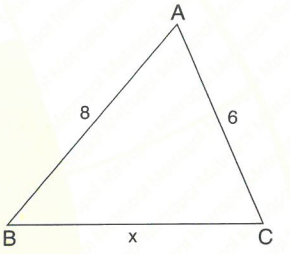
$15 - (a + b) < x + y < 15 + a + b$

$15 - 12 < x + y < 15 + 12$

$3 < x + y < 27$

**Yanıt / Answer A**

**11.**




$2 < x < 14 \ldots (1)$

$m(\widehat{BAC}) < 90°$

$x^2 < 8^2 + 6^2$

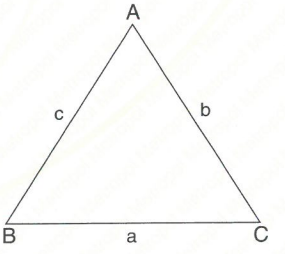
$x < 10 \ldots (2)$

$\left.\begin{array}{r} 2 < x < 14 \\ x < 10 \end{array}\right\} \Rightarrow 2 < x < 10$

$\sum x = 3 + 4 + 5 + 6 + 7 + 8 + 9 = 42$

**Yanıt / Answer C**

**12.**




$a + b + c = 45$

$b - c < a < b + c$

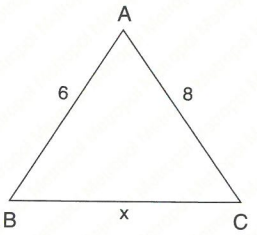
$b - c < a < 45 - a$

$a + b - c < 2a < 45$

$\max(a) = 22$ cm

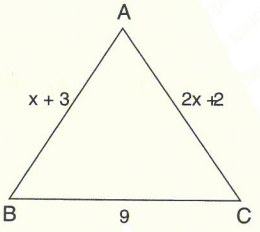
**Yanıt / Answer C**

**1.** $x \in Z$,
$m(\widehat{A}) > m(\widehat{B})$,
$|AB| = 6$ cm,
$|AC| = 8$ cm,
$|BC| = x$
$\Rightarrow \sum$ **x = ? cm**



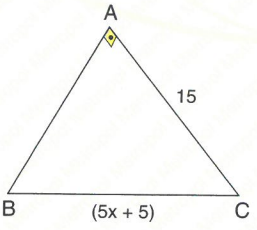

A) 60 B) 55 C) 50 D) 45 E) 40

**2.** $|AB| = (x + 3)$ cm,
$|AC| = (2x + 2)$ cm,
$|BC| = 9$ cm
$\Rightarrow$ **? < x < ?**



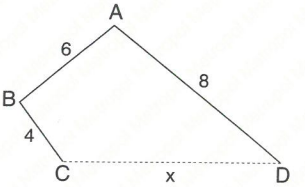

A) $1 \le x < 9$ B) $1 < x \le 9$
D) $1 < x < 10$ D) $\frac{4}{3} < x < 10$
E) $2 < x < 11$

**3.** $x \in Z$,
$[BA] \perp [AC]$,
$|AC| = 15$ cm,
$|BC| = (5x + 5)$ cm
$\Rightarrow$ **min(x) = ? cm**



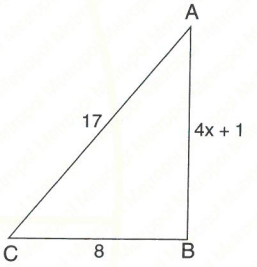

A) 1 B) 2 C) 3 D) 4 E) 5

**4.** $x \in Z$,
$|AB| = 6$ cm,
$|BC| = 4$ cm,
$|AD| = 8$ cm
$\Rightarrow$ **max(x) = ? cm**



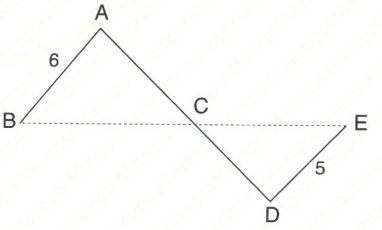

A) 12 B) 13 C) 16 D) 17 E) 18

**5.** $x \in Z$,
$|AC| = 17$ cm,
$|AB| = (4x + 1)$ cm,
$|CB| = 8$ cm
$\Rightarrow \sum$ **x = ? cm**




A) 9 B) 10 C) 11 D) 12 E) 14

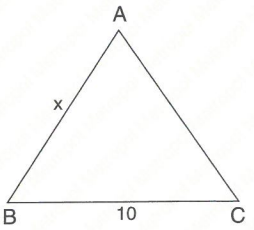
**6.**




$|AB| = 6$ cm, $|DE| = 5$ cm, $|AD| = 10$ cm
$\Rightarrow$**max(|BE|) = ? cm**

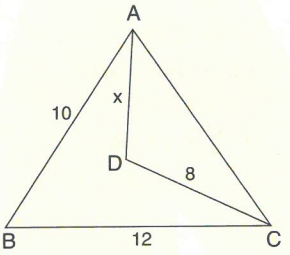
A) 20 B) 19 C) 18 D) 17 E) 16

**7.** $x \in Z$,
$|AB| = 3 \cdot |AC|$,
$|BC| = 10$ cm,
$|AB| = x$ cm
$\Rightarrow \sum x = ?$ **cm**



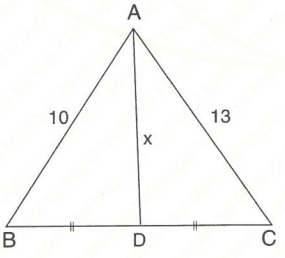

A) 77 B) 70 C) 63 D) 56 E) 49

**8.** $x \in Z$,
$|AB| = 10$ cm,
$|BC| = 12$ cm,
$|DC| = 8$ cm
$\Rightarrow$ **max(x) = ? cm**



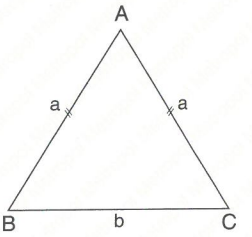

A) 10 B) 11 C) 12 D) 13 E)14

**9.** $x \in Z$,
$|AD| = x$ cm,
$|BD| = |DC|$
$|AB| = 10$ cm,
$|AC| = 13$ cm
$\Rightarrow$ **max(x) = ? cm**



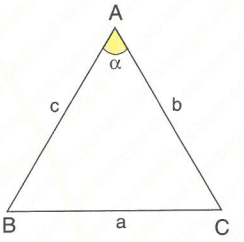

A) 19 B) 20 C) 21 D) 22 E) 23

**10.** $|AB| = |AC| = a$,
$|BC| = b$,
$b > a$
$\Rightarrow$ **min (m($\widehat{BAC}$)) = ?**



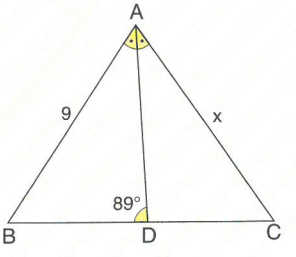

A) 59° B) 60° C) 61° D) 62° E) 63°

**11.** $\alpha \in Z$,
$c < b < a$,
$m(\widehat{A}) = \alpha$
$\Rightarrow$ **max($\alpha$) = ?**




A) 150° B) 156° C) 161° D) 170° E) 177°

**12.** $x \in Z$,
$m(\widehat{BAD}) = m(\widehat{DAC})$,
$m(\widehat{BDA}) = 89°$,
$|AB| = 9$ cm
$\Rightarrow$ **min(x) = ? cm**

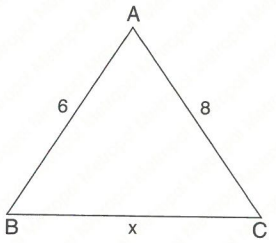



A) 10 B) 11 C) 12 D) 13 E) 14

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | D | C | D | D | A | A | E | E | C | E | A |

**1.**




$m(\widehat{A}) > m(\widehat{B}) \Rightarrow x > 8$ ... (1)

$8 - 6 < x < 8 + 6$

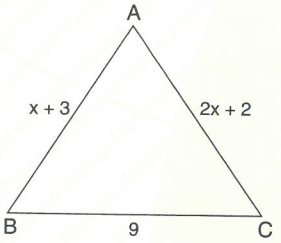
$2 < x < 14$ ... (2)

$8 < x < 14$

$x \in Z \Rightarrow \sum x = 9 + 10 + 11 + 12 + 13 = 55$

**Yanıt / Answer B**

**2.**




$2x + 2 - (x + 3) < 9 < x + 3 + 2x + 2$

$x - 1 < 9 < 3x + 5$

$\frac{4}{3} < x < 10$

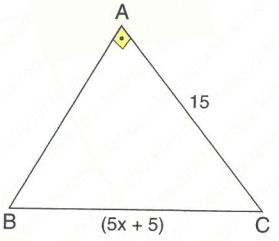
**Yanıt / Answer D**

**3.** $15 < 5x + 5$

$10 < 5x$

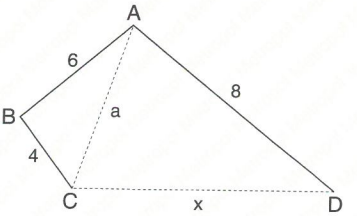
$2 < x$

$\Rightarrow \min(x) = 3$




**Yanıt / Answer C**

**4.**




$2 < a < 10$

$x \in Z,\ a - 8 < x < a + 8$

$\max(x) \Rightarrow \max(a),\ 9 < \max(a) < 10$

$\Rightarrow x < 18$

$\max(x) = 17$ cm

**Yanıt / Answer D**

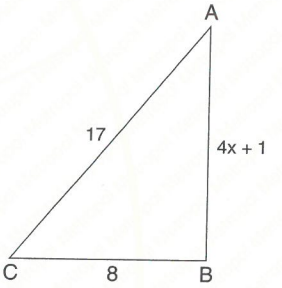
**5.** $9 < 4x + 1 < 25$

$8 < 4x < 24$

$2 < x < 6$

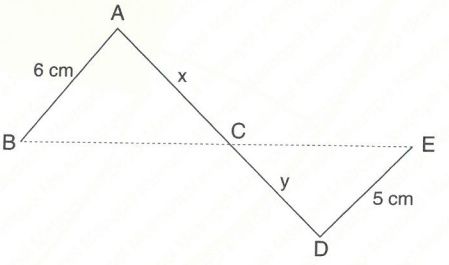
$\sum x = 3 + 4 + 5$

$= 12$ cm




**Yanıt / Answer D**

**6.**




$6 - x < |BC| < 6 + x$

$5 - y < |CE| < 5 + y$

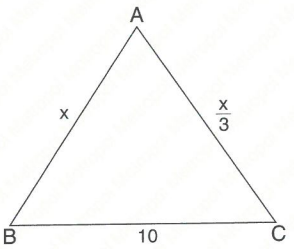
$|BC| + |CE| < 11 + x + y$

$|BC| + |CE| < 21$

$\max(|BE|) = 20$ cm

**Yanıt / Answer A**

**7.**




$x-\frac{x}{3} < 10 < x+\frac{x}{3}$

$\frac{2x}{3} < 10 < \frac{4x}{3}$

$2x < 30 < 4x$

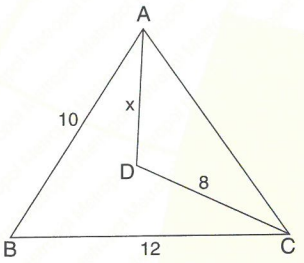
$x < 15 < 2x$

$7 < x < 15$

$\sum x = 8+9+10+11+12+13+14 = 77\,\text{cm}$

**Yanıt / Answer A**

**8.**




$12-10 < |AC| < 12+10$

$2 < |AC| < 22$

$\max(x) \Rightarrow \max|AC|$

$\left.\begin{array}{l} 21 < \max|AC| < 22 \\ x-8 < |AC| < x+8 \end{array}\right\} x+8 \le 22 \Rightarrow x \le 14$

$\max(x) = 14\,\text{cm}$

**Yanıt / Answer E**

**9.** $13-10 < |BC| < 13+10$

$3 < 2a < 23$

$\frac{3}{2} < a < \frac{23}{2}$

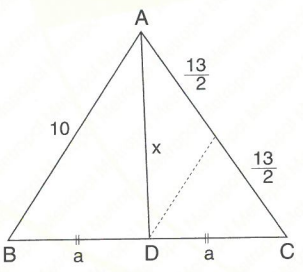
$\max(x) = \max(a)$

$10 < \max(a) < 11$

$13-11 < \max(x) < 13+11$

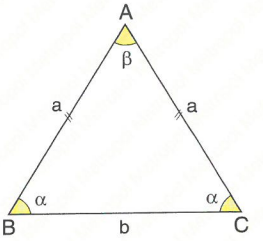
$2 < \max(x) < 24$

$\Rightarrow \max(x) = 23\,\text{cm}$




**Yanıt / Answer E**

**10.**




$a < b \Rightarrow \underbrace{m(\widehat{B})}_{\alpha} = \underbrace{m(\widehat{C})}_{\alpha} < \underbrace{m(\widehat{A})}_{\beta}$

$2\alpha + \beta = 180°...(1)$

$\beta = 180° - 2\alpha$

$3\alpha < 180° \Rightarrow \alpha < 60°$

$2\alpha < 120°...(2)$

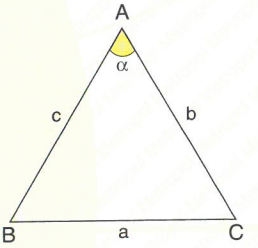
$2\alpha = 180° - \beta$

$180° - \beta < 120°$

$60° < \beta \Rightarrow \min(\beta) = 61°$

**Yanıt / Answer C**

**11.**




$c < b < a \Rightarrow m(\widehat{C}) < m(\widehat{B}) < m(\widehat{A}) = \alpha$

$\max(\alpha) \Rightarrow \min[m(\widehat{C})]$

$\Rightarrow \min[m(\widehat{B})]$

$m(\widehat{C}) = 1°$ ve (and) $m(\widehat{B}) = 2°$

$m(\widehat{A}) + m(\widehat{B}) + m(\widehat{C}) = 180°$

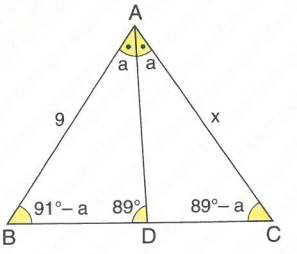
$\max(\alpha) = 177°$

**Yanıt / Answer E**

**12.** $89°-a < 91°-a$

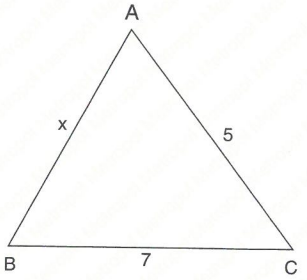
$\Rightarrow 9 < x$

$\min(x) = 10\,\text{cm}$



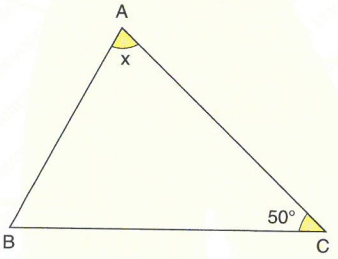

**Yanıt / Answer A**

**1.** $x \in Z$,
$|AC| = 5$ cm,
$|BC| = 7$ cm,
$|AB| = x$ cm
**min(x) = ? cm**



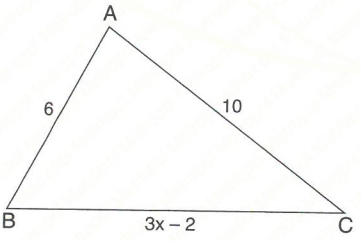

A) 1 B) 2 C) 3 D) 4 E) 5

**2.** $x \in Z$,
$|AC| < |BC|$,
$m(\widehat{ACB}) = 50°$,
$m(\widehat{BAC}) = x$
$\Rightarrow$ **min(x) = ?**



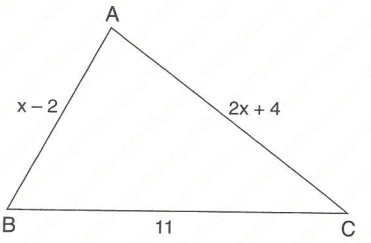

A) 65° B) 66° C) 67° D) 68° E) 69°

**3.** $x \in Z$,
$|AB| = 6$ cm,
$|AC| = 10$ cm,
$|BC| = 3x - 2$
$\Rightarrow \sum$ **x = ?**



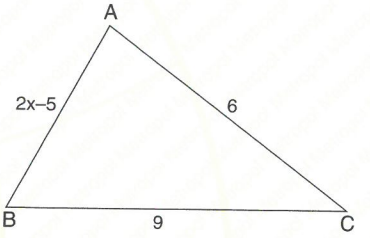

A) 7 B) 8 C) 9 D) 10 E) 12

**4.** $x \in Z$,
$|AB| = x - 2$,
$|AC| = 2x + 4$,
$|BC| = 11$ cm
$\Rightarrow$ **x = ?**



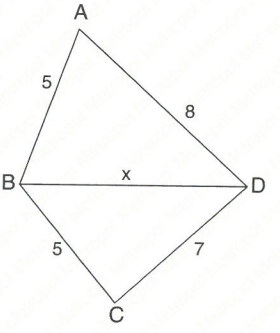

A) 1 B) 2 C) 3 D) 4 E) 5

**5.** $x \in Z$,
$m(\widehat{A}) < m(\widehat{C})$,
$|AB| = 2x - 5$,
$|AC| = 6$ cm
$|BC| = 9$ cm
$\Rightarrow \sum$ **x = ?**



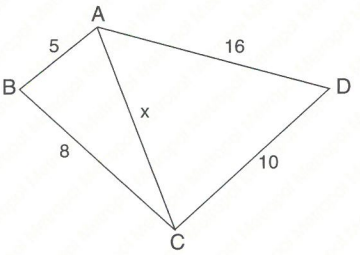

A) 17 B) 18 C) 24 D) 26 E) 27

**6.** $x \in Z$,
$|AB| = 5$ cm
$|BC| = 5$ cm,
$|CD| = 7$ cm,
$|AD| = 8$ cm,
$|BD| = x$
$\Rightarrow$ **? < x < ?**



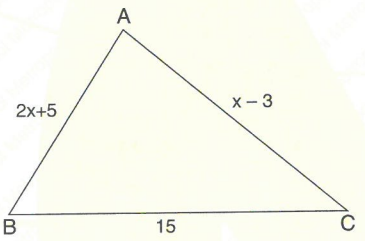

A) $2 < x < 12$ B) $3 < x < 12$ C) $3 < x < 13$
D) $2 < x < 13$ E) $5 < x < 25$

**7.** IADI = 16 cm,
IDCI = 10 cm,
IABI = 5 cm,
IBCI = 8 cm
⇒ **? < x < ?**



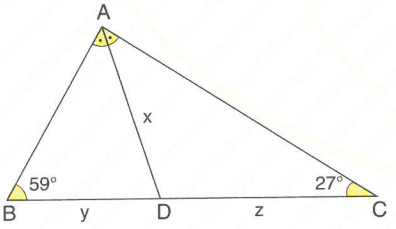

A) 3 < x < 13 B) 6 < x < 13 C) 3 < x < 26
D) 6 < x < 26 E) 3 < x < 6

**8.** x ∈ Z,
IACI = x – 3,
IABI = 2x + 5,
IBCI = 15 cm
⇒ **min(x) = ?**




A) 3 B) 4 C) 5 D) 6 E) 7

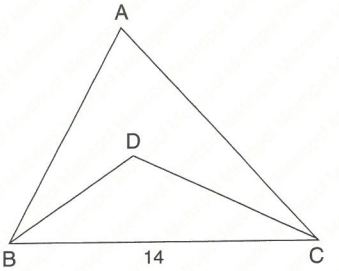
**9.**




m($\widehat{BAD}$) = m($\widehat{DAC}$), m($\widehat{ABC}$) = 59°, m($\widehat{ACB}$) = 27°,
IADI = x, IBDI = y, IDCI = z
⇒ **? < ? < ?**

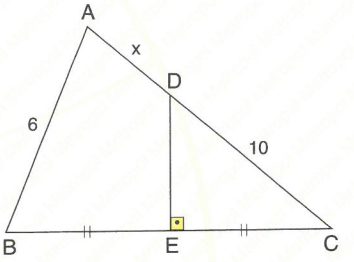
A) y < z < x B) x < z < y C) x < y < z
D) z < y < x E) y < x < z

**10.** Ç($\overset{\triangle}{ABC}$) = 32 cm,
IBCI = 14 cm
IBDI + IDCI = x
⇒ **? < x < ?**



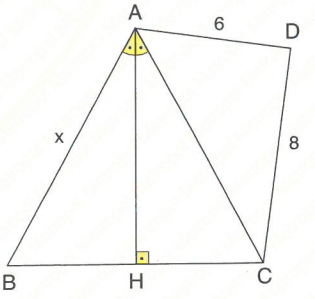

A) 14 < x < 32 B) 14 < x < 28 C) 14 < x < 18
D) 18 < x < 28 E) 18 < x < 32

**11.** 90° < m($\widehat{A}$)
IBEI = IECI,
[DE] ⊥ [BC],
IABI = 6 cm,
IDCI = 10 cm
IADI = x
⇒ **? < x < ?**




A) 4 < x < 16 B) 4 < x < 10 C) 6 < x < 16
D) 4 < x < 8 E) 6 < x < 8

**12.** x ∈ Z,
[AH] ⊥ [BC],
m($\widehat{BAH}$) = m($\widehat{HAC}$),
IADI = 6 cm,
IDCI = 8 cm
⇒ **∑x = ? cm**




A) 86 B) 88 C) 91 D) 94 E) 96

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | B | E | D | A | B | B | C | E | C | D | B |

# BÖLÜM CHAPTER 7

## TARİHSEL NOT / HISTORICAL NOTE

### Gottfried Wilhelm Leibniz [1646 – 1716]

Alman matematikçi ve filozoftur. Matematik tarihi ve felsefe tarihinde önemli bir yer tutar. Matematiksel fonksiyon kavramının onun zamanında trigonometik ve logaritmik tablolarda kapalı olmasına rağmen, Leibniz 1692 ve 1694 yılları arasında eğriden türetilen apsis, ordinat, teğet, kiriş ve diklik geometrik kavramlarını kapalı olarak benimseyip, belirten ilk kişidir. 18. Yüzyılda "fonksiyon" bu geometrik birlikteliğini yitirmiştir. Leibniz lineer denklemlerdeki sistemin katsayılarının şu an matris olarak adlandırdığımız bir düzene göre ayarlanarak sistemin sonucunun bulunabileceğini gören ilk insan olmuştur.

German mathematician and philosopher. he has an important rule in the history of mathematics and philosophy. Although the concept of mathematical function is closed in trigonometrically and logarithmic tables at his time, Leibniz is the first person to adopt the geometric concepts of abscissa, ordinate, tangent, beam and perpendicularity, which are derived from arc between 1692 and 1694. In the 18th century, "function" has lost this geometric unity. Leibniz has been the first person to see that the system's coefficients in linear equations can be adjusted to a scheme we now call matrices and therefore the result of the system can be found.

# ÇOKGENLER ve DÖRTGENLER
# POLYGONS and QUADRANGLES

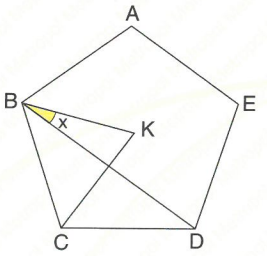
**Bu bölüm 60 çözümlü test sorusu ve 12 test sorusu içermektedir.**

**This chapter includes 60 test questions with solutions and 12 test questions.**

**BÖLÜM / CHAPTER 7**

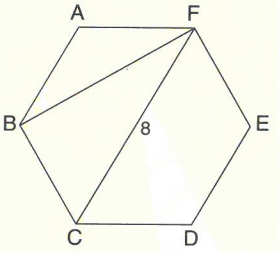
**ÇOKGENLER VE DÖRTGENLER / POLYGONS and QUADRILATERALS**

**1.** ABCDE bir düzgün beşgen, BKC eşkenar üçgendir.
ABCDE is a regular pentagon, BKC is an equilateral triangle.
$\Rightarrow$ **$m(\widehat{DBK}) = x = ?$**



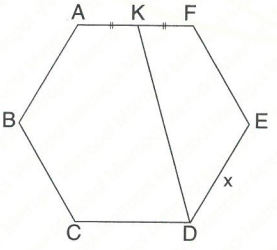

A) 12° B) 24° C) 30° D) 36° E) 48°

**2.** ABCDEF bir düzgün altıgendir.
ABCDEF is a regular hexagon.
$|CF| = 8$ cm
$\Rightarrow$ **$|BF| = ?$ cm**



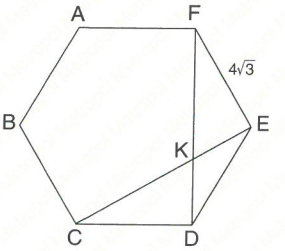

A) 4 B) $4\sqrt{3}$ C) 5 D) 6 E) $6\sqrt{3}$

**3.** ABCDEF bir düzgün altıgendir.
ABCDEF is a regular hexagon.
$|AK| = |KF|$,
$|DK| = 2\sqrt{13}$ cm
$\Rightarrow$ **$|ED| = x = ?$ cm**



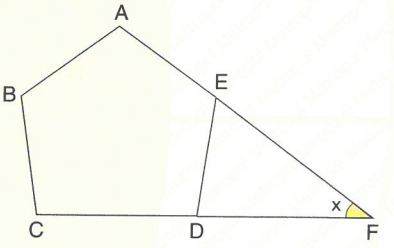

A) 1 B) 2 C) 4 D) 6 E) 8

**4.** ABCDEF düzgün bir altıgendir.
ABCDEF is a regular hexagon.
$|EF| = 4\sqrt{3}$ cm
$\Rightarrow$ **$|CK| = ?$ cm**




A) 4 B) 5 C) 6 D) 7 E) 8

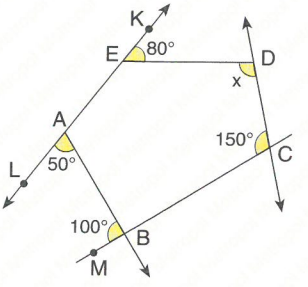
**5.**




ABCDE bir düzgün beşgendir.
ABCDE is a regular pentagon.
$\Rightarrow$ **$m(\widehat{DFE}) = x = ?$**

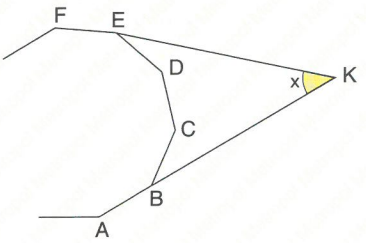
A) 30° B) 36° C) 39° D) 45° E) 54°

**6.** $m(\widehat{KED}) = 80°$,
$m(\widehat{DCB}) = 150°$,
$m(\widehat{LAB}) = 50°$,
$m(\widehat{MBA}) = 100°$
$\Rightarrow$ **$m(\widehat{EDC}) = x = ?$**




A) 60° B) 70° C) 80° D) 90° E) 100°

**7.**




ABCDEF.... düzgün çokgendir.

ABCDEF.... is a regular polygon.

$m(\widehat{DEK}) = 35° \Rightarrow$ **$m(\widehat{EKB}) = x = ?$**

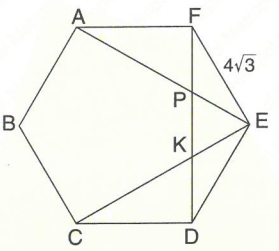
A) 40° B) 50° C) 60° D) 70° E) 80°

**8.** ABCDEF bir düzgün altıgendir.

ABCDEF is a regular hexagon.

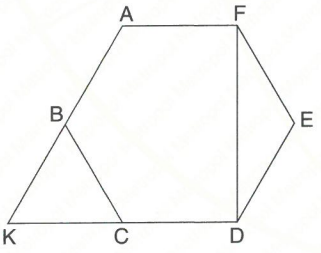
$|EF| = 4\sqrt{3}$ cm

**$\Rightarrow |PK| = ?$ cm**




A) 4 B) 5 C) 8 D) 10 E) 12

**9.**




ABCDEF bir düzgün altıgendir

ABCDEF is a regular hexagon.

$A(\widehat{KBC}) = 9\sqrt{3}$ cm$^2$

**$\Rightarrow$ Çevre / the perimeter $(\widehat{FED}) = ?$ cm**

A) $6(3 + 2\sqrt{3})$ B) $6(3 + 3\sqrt{3})$

C) $6(2 + 3\sqrt{3})$ D) $6(2 + \sqrt{3})$

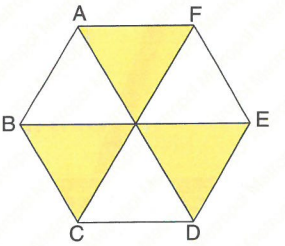
E) $18\sqrt{3}$

**10.** ABCDEF bir düzgün altıgendir.

ABCDEF is a regular hexagon.

$TA(SA) = 12\sqrt{3}$ cm$^2$

**$\Rightarrow |AF| = ?$ cm**

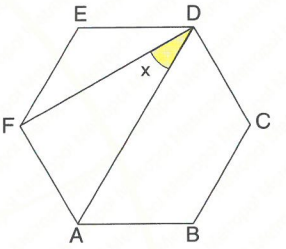



A) 4 B) 5 C) 8 D) 10 E) 12

**11.** ABCDEF bir düzgün altıgendir.

ABCDEF is a regular hexagon.

**$\Rightarrow m(\widehat{FDA}) = x = ?$**




A) 30° B) 45° C) 60° D) 75° E) 90°

**12.** [EF] ve [BF] açıortaydır.

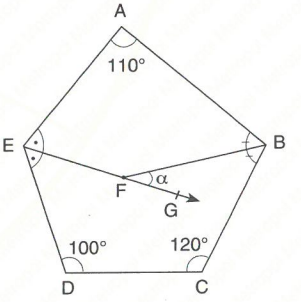
[EF] and [BF] are bisectors.

$m(\widehat{EAB}) = 110°$,

$m(\widehat{EDC}) = 100°$,

$m(\widehat{DCB}) = 120°$

**$\Rightarrow \alpha = ?$**

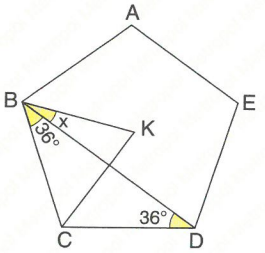



A) 35° B) 40° C) 45° D) 50° E) 55°

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | B | C | E | B | C | A | A | D | A | A | A |

**1.**




$m(\widehat{A}) = m(\widehat{B}) = m(\widehat{C}) = m(\widehat{D}) = m(\widehat{E}) = 180° - \frac{360°}{5}$

$\Rightarrow m(\widehat{C}) = 108°$

BCD ikizkenar üçgendir. / BCD is an isosceles triangle.

$m(\widehat{CBD}) = \frac{180° - 108°}{2} = 36°$

BKC eşkenar üçgendir. / BCD is a equilateral triangle.

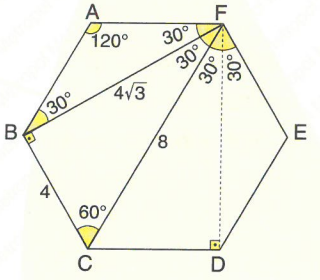
$m(\widehat{CBK}) = 60° \Rightarrow x = 60° - 36° = 24°$

**Yanıt / Answer B**

**2.** $\widehat{FBC}$ (30°, 60°, 90°)

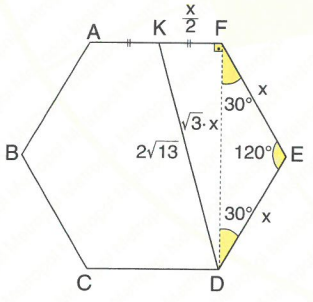
$|BF| = \frac{\sqrt{3}}{2} \cdot 8$

$= 4\sqrt{3}$ cm




**Yanıt / Answer B**

**3.**




$m(\widehat{FCD}) = 120° \Rightarrow |FD| = \sqrt{3} \cdot x$

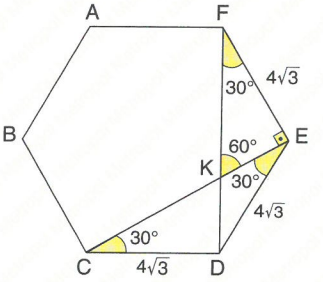
$|DK|^2 = |KF|^2 + |DF|^2$ [ Pythagor ]

$(2\sqrt{13})^2 = \left(\frac{x}{2}\right)^2 + (\sqrt{3}.x)^2$

$52 = \frac{x^2}{4} + 3x^2 \Rightarrow x = 4$ cm

**Yanıt / Answer C**

**4.**




$\widehat{FKE}$ (30°, 60°, 90°)

$|KE| = 4$ cm

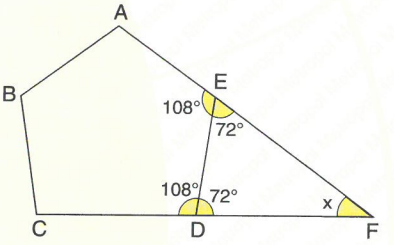
$m(\widehat{FED}) = 120°$

$|FD| = |CE| = 4\sqrt{3} \cdot \sqrt{3} = 12$ cm

$|CK| = 12 - 4 = 8$ cm

**Yanıt / Answer E**

**5.**

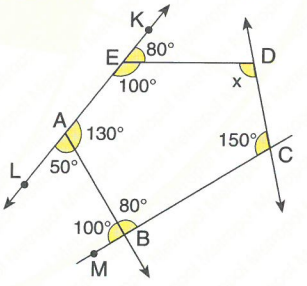



$m(\widehat{D}) = m(\widehat{E}) = 180° - \frac{360°}{5} = 108°$

$x = 180° - 2 \cdot 72° \Rightarrow x = 36°$

**Yanıt / Answer B**

**6.**

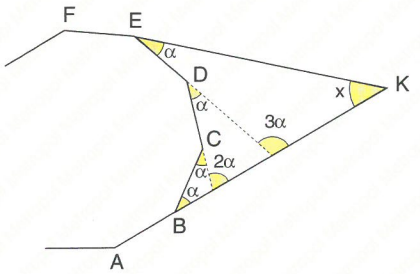



$x + 150° + 80° + 130° + 100° = (5 - 2) \cdot 180°$

$x = 80°$

**Yanıt / Answer C**

**7.**



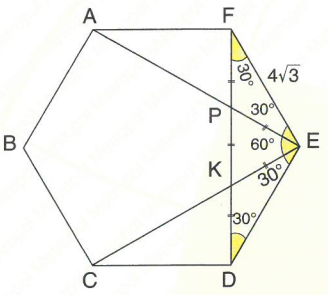

$\alpha + 3\alpha + x = 180°$

$\alpha = 35° \Rightarrow 140° + x = 180°$

$x = 40°$

**Yanıt / Answer A**

**8.**

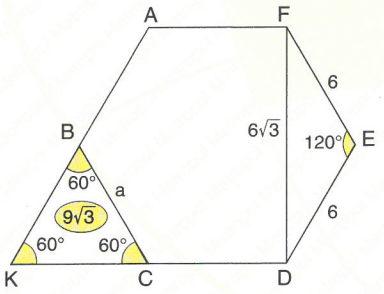



$m(\widehat{FED}) = 120° \Rightarrow |FD| = 4\sqrt{3}\cdot\sqrt{3} = 12$ cm

$3 \cdot |PK| = |FD| \Rightarrow |PK| = \frac{12}{3} = 4$ cm

**Yanıt / Answer A**

**9.**




$A(\widehat{BKC}) = 9\sqrt{3} = \frac{\sqrt{3}\cdot a^2}{4} \Rightarrow a^2 = 36$

$= a = 6$ cm

$m(\widehat{FED}) = 120° \Rightarrow |FD| = 6\sqrt{3}$ cm$^2$.

Çevre / The perimeter $(\widehat{FED}) = 12 + 6\sqrt{3}$

$= 6(2 + \sqrt{3})$ cm

**Yanıt / Answer D**

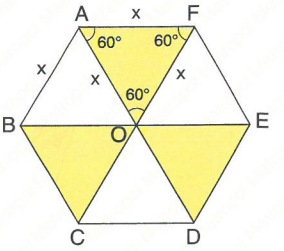
**10.**

$A(\widehat{AOF}) = \frac{x^2\cdot\sqrt{3}}{4}$

$TA/SA = 3 \cdot A(\widehat{AOF})$

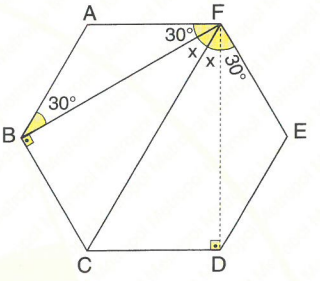
$12\sqrt{3} = 3 \cdot \frac{x^2\cdot\sqrt{3}}{4}$

$x^2 = 16 \Rightarrow x = 4$ cm




**Yanıt / Answer A**

**11.**



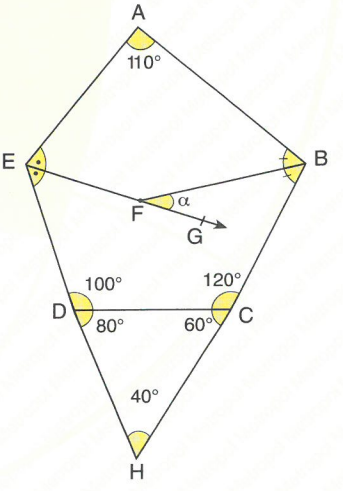

$m(\widehat{AFE}) = 180° - \frac{360°}{6} = 120°$

$m(\widehat{AFE}) = 2x + 30° + 30°$

$120° = 2x + 60° \Rightarrow x = 30°$

**Yanıt / Answer A**

**12.**




E, D, H ve B, C, H noktaları doğrusaldır.

E, D, H and B, C, H are in the same line.

$\alpha = \frac{|m(\widehat{EAB}) - m(\widehat{DHC})|}{2}$

$\alpha = \frac{|110° - 40°|}{2} = 35°$

**Yanıt / Answer A**

1. ABCD bir dörtgendir.

ABCD is a quadrilateral.

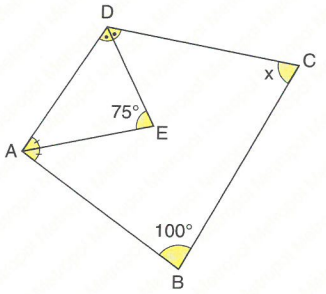
$m(\widehat{EAD}) = m(\widehat{EAB})$,

$m(\widehat{CDE}) = m(\widehat{EDA})$,

$m(\widehat{DEA}) = 75°$,

$m(\widehat{ABC}) = 100°$

$\Rightarrow$ **$m(\widehat{DCB}) = x = ?$**




A) 40° B) 45° C) 50° D) 55° E) 60°

2. ABCD bir dörtgendir.

ABCD is a quadrilateral.

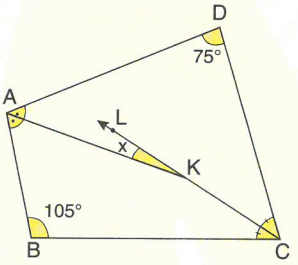
$m(\widehat{DAK}) = m(\widehat{KAB})$,

$m(\widehat{BCK}) = m(\widehat{DCK})$,

$m(\widehat{ABC}) = 105°$,

$m(\widehat{ADC}) = 75°$

$\Rightarrow$ **$m(\widehat{AKL}) = x = ?$**




A) 15° B) 20° C) 25° D) 30° E) 35°

3. ABCD bir dörtgendir.

ABCD is a quadrilateral.

$[BA] \perp [AD]$,

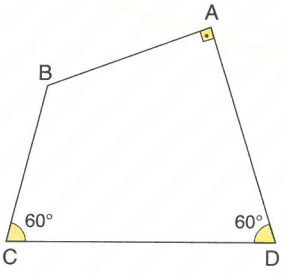
$m(\widehat{BCD}) = 60°$,

$m(\widehat{ADC}) = 60°$

$|CD| = 10$ cm,

$|BA| = 2\sqrt{3}$ cm

$\Rightarrow$ **$|BC| = ?$ cm**




A) 5 B) 6 C) 7 D) 8 E) 9

4. ABCD bir dörtgendir.

ABCD is a quadrilateral.

$[BA] \perp [AD]$,

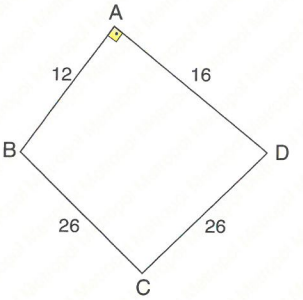
$|AB| = 12$ cm,

$|AD| = 16$ cm,

$|CD| = 26$ cm,

$|BC| = 26$ cm

$\Rightarrow$ **$A(ABCD) = ?$ cm$^2$**




A) 168 B) 195 C) 224 D) 308 E) 336

5. ABCD bir dörtgendir.

ABCD is a quadrilateral.

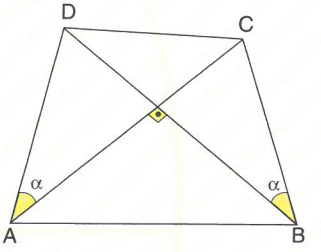
$[AC] \perp [BD]$,

$m(\widehat{DAB}) = 80°$,

$m(\widehat{CBA}) = 70°$,

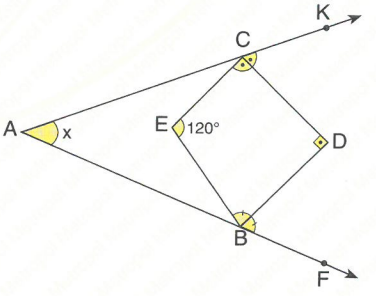
$m(\widehat{DAC}) = m(\widehat{CBD}) = \alpha$

$\Rightarrow \alpha = ?$




A) 30° B) 35° C) 40° D) 45° E) 50°

6.

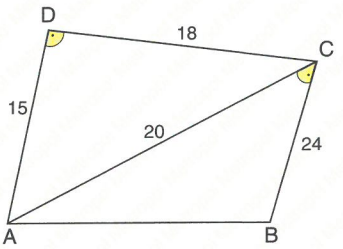



$[CD] \perp [DB]$, $m(\widehat{ECD}) = m(\widehat{DCK})$ , $m(\widehat{EBD}) = m(\widehat{DBF})$

$m(\widehat{CEB}) = 120° \Rightarrow$ **$m(\widehat{CAB}) = x = ?$**

A) 40° B) 50° C) 60° D) 70° E) 80°

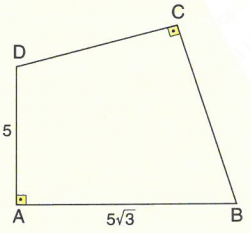
**7.**




$m(\widehat{ADC}) = m(\widehat{ACB})$ , IADI = 15 cm, IDCI = 18 cm,
IACI = 20 cm, IBCI = 24 cm ⇒ **IABI = ? cm**

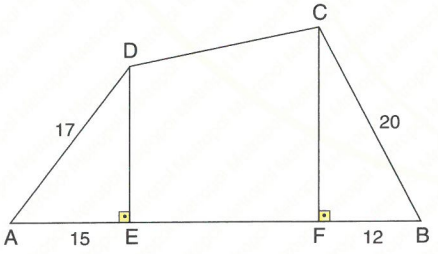
A) $\frac{50}{3}$ B) $\frac{60}{3}$ C) $\frac{70}{3}$ D) $\frac{80}{3}$ E) $\frac{90}{3}$

**8.** ABCD bir dörtgendir.
ABCD is a quadrilateral.
[DA] ⊥ [AB],
[DC] ⊥ [BC],
IADI = 5 cm,
IABI = $5\sqrt{3}$ cm,
IBCI = 6 cm
⇒ **IDCI = ? cm**




A) 6 B) 7 C) 8 D) 9 E) 10

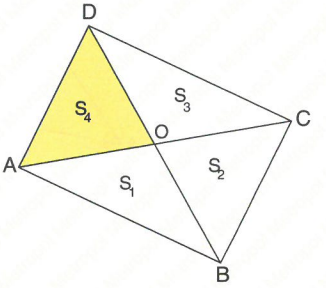
**9.**




ABCD bir dörtgendir. / ABCD is a quadrilateral.
[DE] ⊥ [AE], [CF] ⊥ [FB], IAEI = 15 cm, IADI = 17 cm,
IFBI = 12 cm, ICBI = 20 cm, IEFI = 8 cm
⇒ **A(ABCD) = ? cm²**

A) 312 B) 300 C) 252 D) 224 E) 212

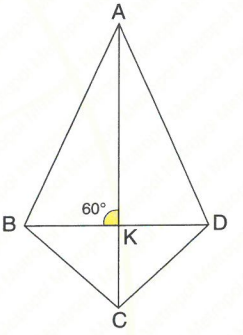
**10.**




ABCD bir dörtgendir. / ABCD is a quadrilateral.
$S_1 = 10\ cm^2$ , $S_2 = 8\ cm^2$ , $S_3 = 4\ cm^2$ ⇒ **$S_4$ = ? cm²**

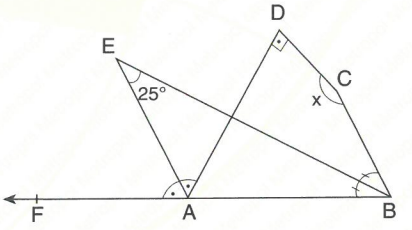
A) 9 B) 8 C) 7 D) 6 E) 5

**11.** ABCD bir dörtgendir.
ABCD is a quadrilateral.
$m(\widehat{BKA}) = 60°$,
IACI = $8\sqrt{3}$ cm,
A(ABCD) = 36 cm²
⇒ **IBDI = ? cm**




A) 3 B) 4 C) 5 D) 6 E) 7

**12.**



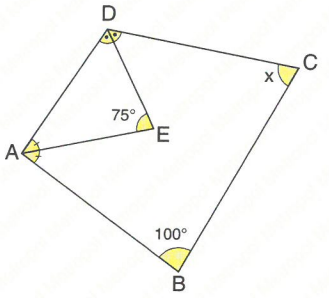

[AE] ve [EB] açıortaydır. / [AE] and [EB] are bisectors.
$m(\widehat{AEB}) = 25°$, $m(\widehat{ADC}) = 90°$ ⇒ **$m(\widehat{DCB})$ = x = ?**

A) 110° B) 120° C) 130° D) 140° E) 150°

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | A | B | E | A | C | D | C | C | E | D | D |

**1.**

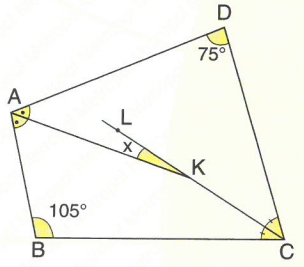



$m(\widehat{E}) = \dfrac{m(\widehat{C}) + m(\widehat{B})}{2}$

$75° = \dfrac{x + 100°}{2} \Rightarrow x = 50°$

**Yanıt / Answer C**

**2.**

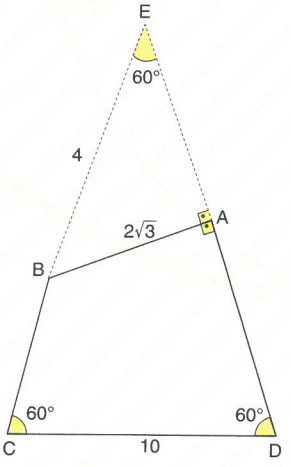



$x = \dfrac{|105° - 75°|}{2} = 15°$

**Yanıt / Answer A**

**3.** C, B, E ve D, A, E doğrusal noktalardır.

C, B, E and D, A, E are on the same line.




$|BE| = \dfrac{2}{\sqrt{3}} \cdot 2\sqrt{3}$

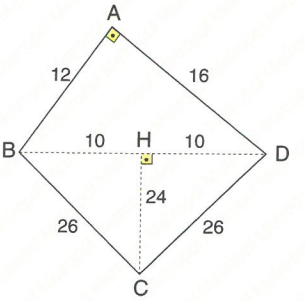
$|BE| = 4$ cm

$|EC| = 10$ cm

$\Rightarrow |BC| = 10 - 4 = 6$ cm

**Yanıt / Answer B**

**4.**




$|BD|^2 = 12^2 + 16^2$ [ Pythagor ]

$|BD| = 20$ cm $\Rightarrow |BH| = |HD| = 10$ cm,

$|CH| = \sqrt{26^2 - 10^2} = 24$ cm

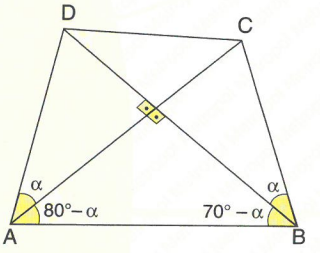
$A(\widehat{ABD}) = \dfrac{12 \cdot 16}{2} = 96\,cm^2$

$A(\widehat{BCD}) = \dfrac{24 \cdot 20}{2} = 240\,cm^2$

$\Rightarrow A(ABCD) = 96 + 240 = 336\,cm^2$

**Yanıt / Answer E**

**5.**



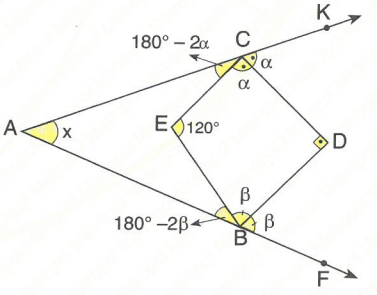

$m(\widehat{DAB}) = 80°$, $m(\widehat{CBA}) = 70°$

$\Rightarrow (80° - \alpha) + (70° - \alpha) = 90°$

$60° = 2\alpha \Rightarrow \alpha = 30°$

**Yanıt / Answer A**

**6.**



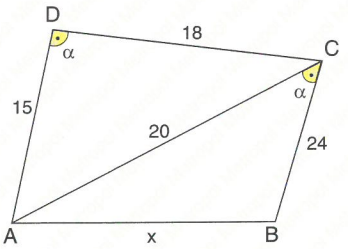

$\overset{\square}{EBDC}$

$120° + \alpha + \beta + 90° = 360° \Rightarrow \alpha + \beta = 150°$

$120° = x + (180° - 2\alpha) + (180° - 2\beta) \Rightarrow x = 60°$

**Yanıt / Answer C**

**7.**

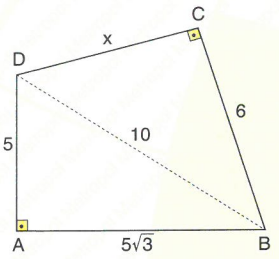



$$\left.\begin{array}{l} m(\widehat{ADC}) = (\widehat{ACB}) \\ \dfrac{18}{24} = \dfrac{15}{20} \end{array}\right\} \Rightarrow \widehat{ADC} \sim \widehat{ACB}$$

$$\frac{18}{24} = \frac{15}{20} = \frac{20}{x} \Rightarrow \frac{3}{4} = \frac{20}{x} \Rightarrow x = \frac{80}{3} \text{ cm}$$

**Yanıt / Answer D**

**8.**




$|DB|^2 = 5^2 + (5\sqrt{3})^2$ [ Pythagor ]

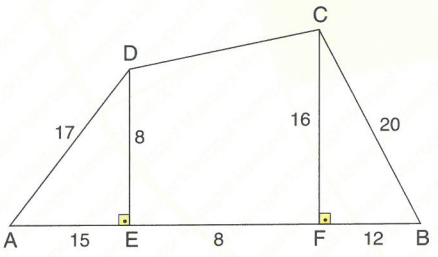
$|DB| = 10$ cm

$x^2 = 10^2 - 6^2$ [ Pythagor ]

$x = 8$ cm

**Yanıt / Answer C**

**9.**




$20^2 = 12^2 + |CF|^2 \Rightarrow |CF| = 16$ cm

$17^2 = 15^2 + |DE|^2 \Rightarrow |DE| = 8$ cm

$A(\widehat{ADC}) = \dfrac{8 \cdot 15}{2} = 60 \text{ cm}^2,$

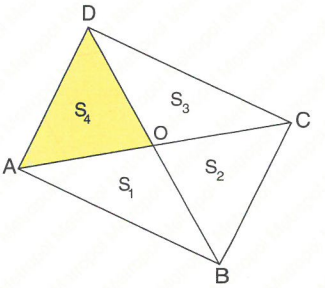
$A(\widehat{FBC}) = \dfrac{16 \cdot 12}{2} = 96 \text{ cm}^2$

$A(DEFC) = \dfrac{8 \cdot (8+16)}{2} = 96 \text{ cm}^2$

$A(ABCD) = 60 + 96 + 96 = 252 \text{ cm}^2$

**Yanıt / Answer C**

**10.**




Dörtgenlerin özelliğinden aşağıdaki eşitlik yazılır.

By using properties of quadrilaterals we can write followings.

$S_1 \cdot S_3 = S_2 \cdot S_4$

$10 \cdot 4 = 8 \cdot S_4$

$\Rightarrow S_4 = 5 \text{ cm}^2$

**Yanıt / Answer E**

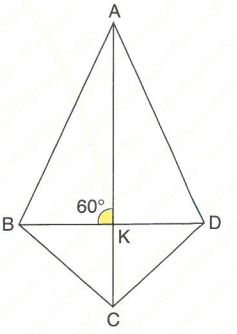
**11.** Alan formülü / The area formula is.

$A(ABCD) = 36 \text{ cm}^2$

$36 = \dfrac{1}{2} \cdot |AC| \cdot |BD| \cdot \sin 60°$

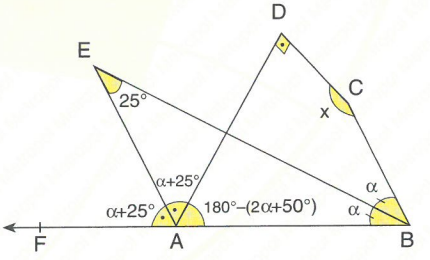
$36 = \dfrac{1}{2} \cdot 8\sqrt{3} \cdot |BD| \cdot \dfrac{\sqrt{3}}{2}$

$\Rightarrow |BD| = 6$ cm




**Yanıt / Answer D**

**12.**



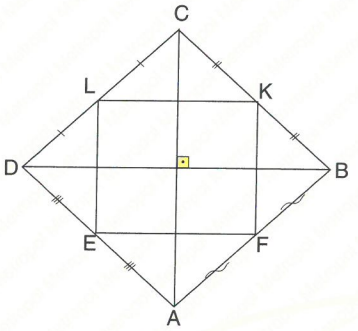

$90° + x + 2\alpha + 180° - 2\alpha - 50° = 360°$

$x + 220° = 360°$

$x = 140°$

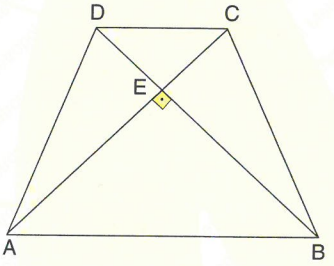
**Yanıt / Answer D**

**1.** [AC] ⊥ [BD],
|AC| = 16 cm,
A(EFKL) = 72 cm$^2$
⇒ **|DB| = ? cm**



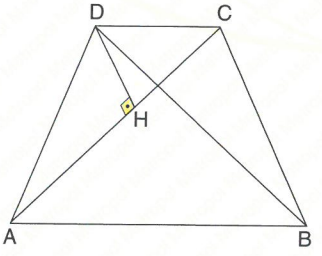

A) 18 B) 20 C) 21 D) 22 E) 24

**2.** [AC] ⊥ [BD],
[DC] // [AB],
|BD| = 18 cm,
|AB| + |DC| = 30 cm
⇒ **A(ABCD) = ? cm$^2$**



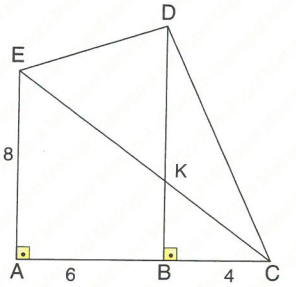

A) 192 B) 196 C) 216 D) 324 E) 432

**3.** [AB] // [DC],
[DH] ⊥ [AC],
|AC| = 12 cm,
|DH| = 3 cm
⇒ **A($\widehat{BDC}$) = ? cm$^2$**



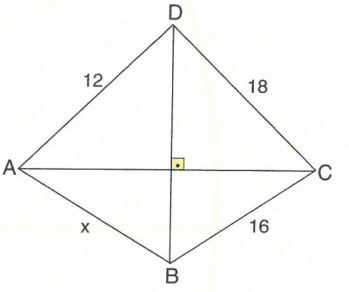

A) 36 B) 32 C) 28 D) 24 E) 18

**4.** [EA] ⊥ [AC],
[CA] ⊥ [DB],
|AE| = 8 cm,
|BD| = 10 cm,
|AB| = 6 cm,
|BC| = 4 cm
⇒ **A($\widehat{EDC}$) = ? cm$^2$**



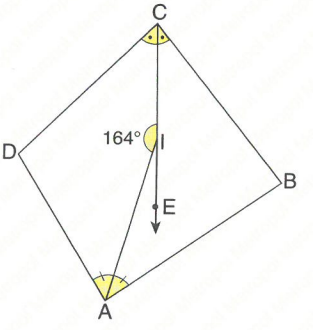

A) 40 B) 36 C) 34 D) 32 E) 28

**5.** [AC] ⊥ [BD],
|AB| = x,
|BC| = 16 cm,
|DC| = 18 cm,
|AD| = 12 cm
⇒ **|AB| = x = ? cm**



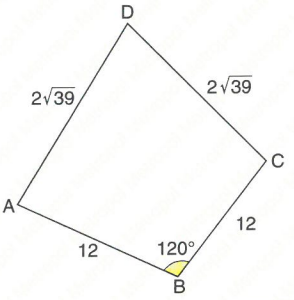

A) 9 B) $6\sqrt{17}$ C) $2\sqrt{19}$ D) $4\sqrt{19}$ E) 13

**6.** m($\widehat{DCE}$) = m($\widehat{ECB}$),
m($\widehat{DAI}$) = m($\widehat{IAB}$),
m($\widehat{AIC}$) = 164°
⇒ **|m($\widehat{D}$) − m($\widehat{B}$)| = ?**



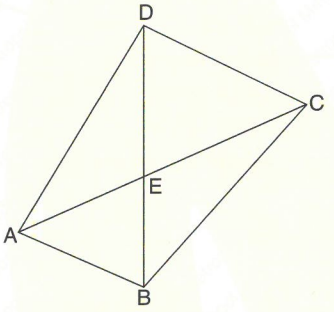

A) 7° B) 14° C) 21° D) 28° E) 32°

**7.** $|AB| = |BC| = 12$ cm,
$|AD| = |DC| = 2\sqrt{39}$ cm,
$m(\widehat{ABC}) = 120°$
$\Rightarrow$ **A(ABCD) = ? cm²**



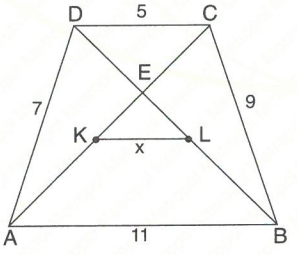

A) $18(2 + \sqrt{3})$ B) $36(2 + \sqrt{3})$ C) $36(3 - \sqrt{3})$ D) $24(3 + \sqrt{3})$ E) $72\sqrt{3}$

**8.** $[AC] \cap [BD] = \{E\}$,
$A(\widehat{AED}) = 36$ cm²,
$A(\widehat{DEC}) = 54$ cm²,
$A(\widehat{BEC}) = 24$ cm²
$\Rightarrow$ **$A(\widehat{AEB})$ = ? cm²**



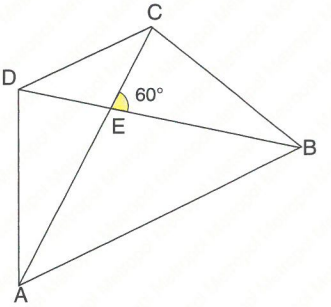

A) 24 B) 18 C) 16 D) 12 E) 6

**9.** $|AB| = 11$ cm,
$|BC| = 9$ cm,
$|DC| = 5$ cm,
$|AD| = 7$ cm,
$|AC| = 12$ cm,
$|BD| = 10$ cm,
$|AK| = |KC|$,
$|BL| = |LD|$
$\Rightarrow$ **$|KL| = x$ = ? cm**



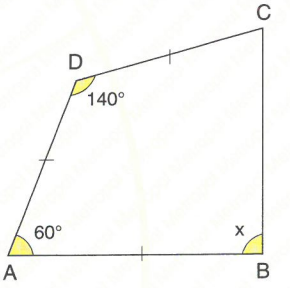

A) 2 B) 3 C) $2\sqrt{2}$ D) $2\sqrt{3}$ E) $3\sqrt{2}$

**10.** $|AC| = 15$ cm,
$|BD| = 12$ cm,
$[AC] \cap [BD] = \{E\}$,
$m(\widehat{CEB}) = 60°$
$\Rightarrow$ **A(ABCD) = ? cm²**



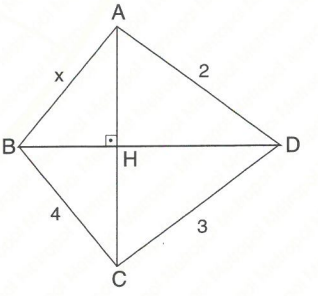

A) 90 B) $45\sqrt{3}$ C) 72 D) $36\sqrt{3}$ E) $90\sqrt{3}$

**11.** $m(\widehat{CDA}) = 140°$,
$m(\widehat{DAB}) = 60°$,
$|AB| = |AD| = |DC|$
$\Rightarrow$ **$m(\widehat{CBA}) = x$ = ?**




A) 80° B) 90° C) 100° D) 110° E) 120°

**12.** $|AD| = 2$ cm,
$|BC| = 4$ cm,
$|CD| = 3$ cm
$\Rightarrow$ **$|AB| = x$ = ? cm**

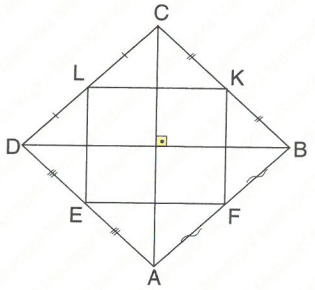



A) $3\sqrt{2}$ B) $3\sqrt{5}$ C) $2\sqrt{3}$ D) $2\sqrt{11}$ E) $\sqrt{11}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | C | E | C | C | E | B | C | C | B | D | E |

**1.**




$A(ABCD) = 2.72 = 144\ cm^2$

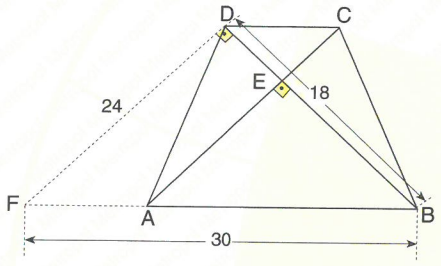
$A(ABCD) = \dfrac{|AC| \cdot |BD|}{2}$

$144 = \dfrac{16 \cdot |BD|}{2}$

$\Rightarrow |BD| = 18\ cm$

**Yanıt / Answer A**

**2.**




|DF| // |AC| çizilirse, aşağıdaki sonuç bulunur.

By drawing |DE| // |AC|, we obtain followings.

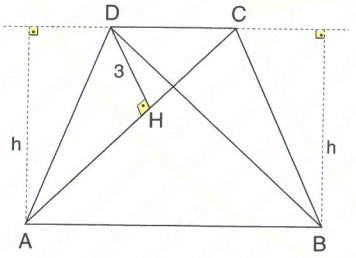
$|FA| = |DC|$ ve(and) $m(\widehat{FDB}) = 90°$

$|FB| = |DC| + |AB| = 30$ cm

$A(ABCD) = A(\widehat{DFB}) = \dfrac{24 \cdot 18}{2} = 216$

**Yanıt / Answer C**

**3.**

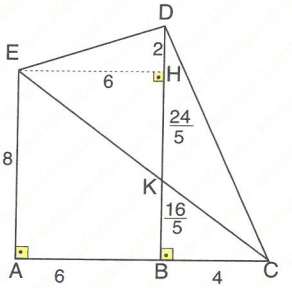



$A(\widehat{ADC}) = A(\widehat{BDC})$

$A(\widehat{ADC}) = \dfrac{3 \cdot 12}{2} = 18 \Rightarrow A(\widehat{BDC}) = 18\ cm^2$

**Yanıt / Answer E**

**4.**




$\widehat{CBK} \sim \widehat{CAE}$

$\dfrac{|BC|}{|CA|} = \dfrac{|KB|}{|EA|} \Rightarrow \dfrac{4}{10} = \dfrac{|KB|}{8}$

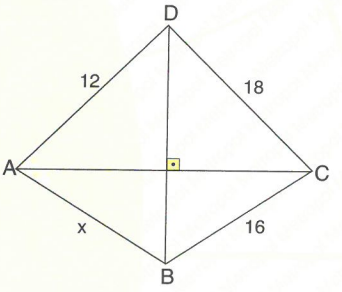
$|KB| = \dfrac{16}{5} \Rightarrow |DK| = \dfrac{34}{5}$

$A(\widehat{EDC}) = A(\widehat{DEK}) + A(\widehat{DKC})$

$= \dfrac{6 \cdot \frac{34}{5}}{2} + \dfrac{4 \cdot \frac{34}{5}}{2} = \dfrac{102}{5} + \dfrac{68}{5} = \dfrac{17°}{5} = 34\,cm^2$

**Yanıt / Answer C**

**5.**




$[AC] \perp [BD] \Rightarrow |AD|^2 + |BC|^2 = |AB|^2 + |DC|^2$

$12^2 + 16^2 = x^2 + 18^2 \Rightarrow x = 2\sqrt{19}$ cm

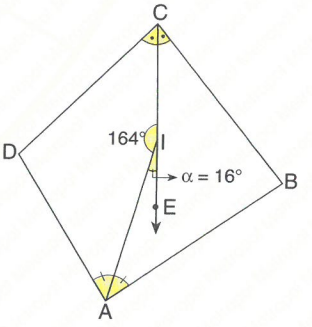
**Yanıt / Answer C**

**6.**

$\alpha = \dfrac{|m(\widehat{D}) - m(\widehat{B})|}{2}$

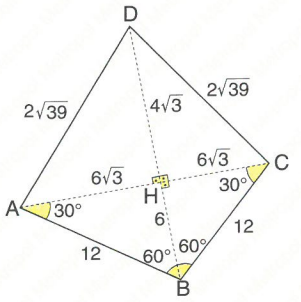
$16° = \dfrac{|m(\widehat{D}) - m(\widehat{B})|}{2}$

$|m(\widehat{D}) - m(\widehat{B})| = 32°$




**Yanıt / Answer E**

**7.**




$|AC| = 6\sqrt{3} + 6\sqrt{3} = 12\sqrt{3}$ cm

$|DH| = \sqrt{(2\sqrt{39})^2 - (6\sqrt{3})^2}$ [Pythagor]

$A(ABCD) = \dfrac{|AC| \cdot |BD|}{2} = \dfrac{12\sqrt{3} \cdot (6 + 4\sqrt{3})}{2}$

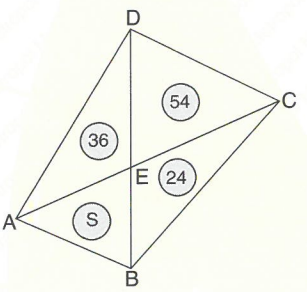
$|DH| = 4\sqrt{3}$ cm

$A(ABCD) = 36 \cdot (2 + \sqrt{3})$ cm$^2$

**Yanıt / Answer B**

**8.** Dörtgenlerin özelliğinden aşağıdaki eşitlik yazılır.

By using properties of quadrilaterals we can write followings.

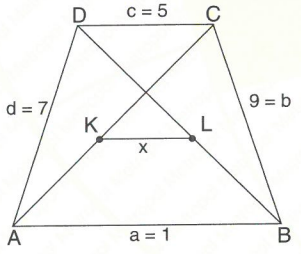



$36 \cdot 24 = 54 \cdot S$

$\Rightarrow S = 16$ cm$^2$

**Yanıt / Answer C**

**9.**




K, L köşegenlerin orta noktasıdır.

K and L are midpoint in the diagonals.

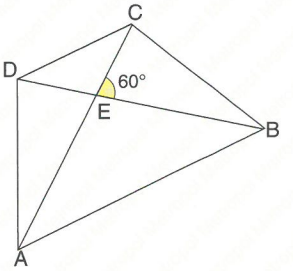
$a^2 + b^2 + c^2 + d^2 = e^2 + f^2 + 4x^2$

$11^2 + 9^2 + 5^2 + 7^2 = 12^2 + 10^2 + 4x^2$

$4x^2 = 32 \Rightarrow x^2 = 8 \Rightarrow x = 2\sqrt{2}$ cm

**Yanıt / Answer C**

**10.**



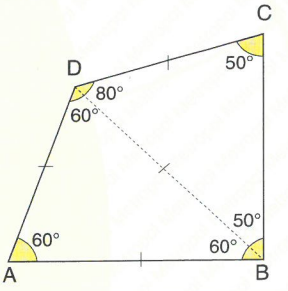

$A(ABCD) = \dfrac{1}{2} \cdot |AC| \cdot |BD| \cdot \sin 60°$

$= \dfrac{1}{2} \cdot 15 \cdot 12 \cdot \dfrac{\sqrt{3}}{2}$

$= 45\sqrt{3}$ cm$^2$

**Yanıt / Answer B**

**11.**




$|DB| = |AD| = |AB| = |DC|$,

$m(\widehat{DBC}) = \dfrac{180° - 80°}{2} = 50°$

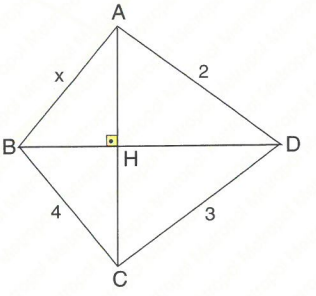
$m(\widehat{ABC}) = x = 50° + 60° = 110°$

**Yanıt / Answer D**

**12.** $[AC] \perp [BD]$

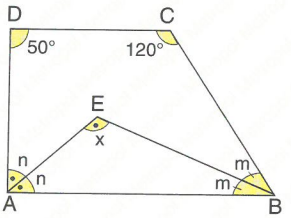
$4^2 + 2^2 = x^2 + 3^2$

$x = \sqrt{11}$ cm



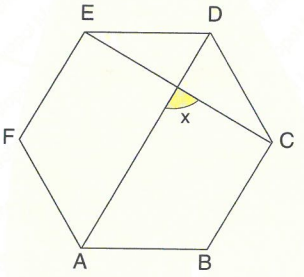

**Yanıt / Answer E**

**1.** $m(\widehat{DAE}) = m(\widehat{EAB})$,
$m(\widehat{ABE}) = m(\widehat{EBC})$,
$m(\widehat{D}) = 50°$,
$m(\widehat{C}) = 120°$
$\Rightarrow$ **$m(\widehat{AEB}) = x = ?$**



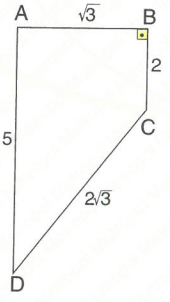

A) 50° B) 60° C) 75° D) 80° E) 85°

**2.** ABCDEF düzgün bir altıgendir.
ABCDEF is a regular hexagon.
$\Rightarrow$ **x = ?**



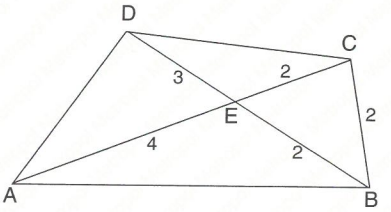

A) 75° B) 90° C) 100° D) 110° E) 120°

**3.** $|AB| \perp |BC|$,
$|AB| = \sqrt{3}$ cm,
$|DC| = 2\sqrt{3}$ cm,
$|AD| = 5$ cm,
$|BC| = 2$ cm
$\Rightarrow$ **A(ABCD) = ? cm²**




A) $\frac{7\sqrt{3}}{2}$ B) $7\sqrt{3}$ C) $\frac{7\sqrt{3}}{3}$ D) $\frac{7\sqrt{3}}{4}$ E) $14\sqrt{3}$

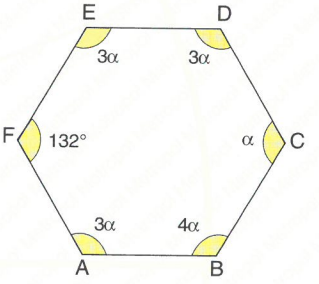
**4.**




$|EB| = |BC| = |CE| = 2$ cm, $|DE| = 3$ cm, $|AE| = 4$ cm
$\Rightarrow$ **A(ABCD) = ? cm²**

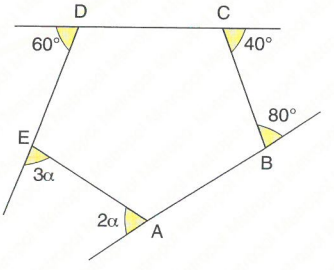
A) 6 B) $\frac{15\sqrt{3}}{2}$ C) 10,5 D) $\frac{7\sqrt{3}}{4}$ E) $2\sqrt{3}$

**5.** $\Rightarrow \alpha = ?$




A) 30° B) 42° C) 45° D) 50° E) 60°

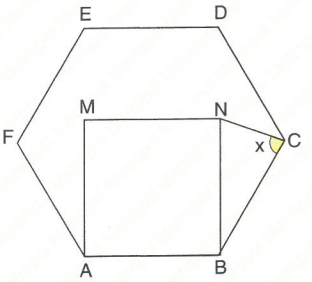
**6.**




$\Rightarrow \alpha = ?$

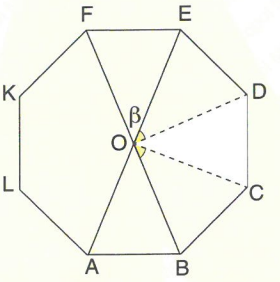
A) 18° B) 24° C) 36° D) 45° E)48°

**7.** ABCDEF düzgün bir altıgendir.
ABCDEF is a regular hexagon.
$\Rightarrow$ **m($\widehat{NCB}$) = ?**



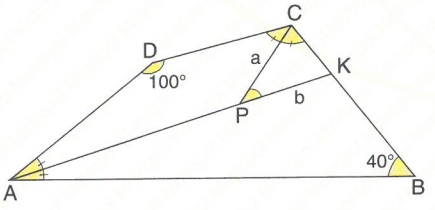

A) 105° B) 90° C) 75° D) 60° E) 45°

**8.** ABCDEFKL düzgün bir sekizgendir.
ABCDEFKL is a regular octagon.
[AE] $\cap$ [BF] = {O}
$\Rightarrow$ **m($\widehat{BOE}$) = $\alpha$ = ?**




A) 108° B) 120° C) 135° D) 145° E) 150°

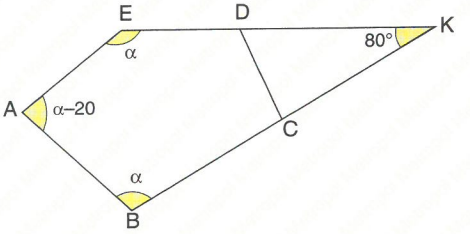
**9.**




m($\widehat{DAK}$) = m($\widehat{KAB}$), m($\widehat{DCP}$) = m($\widehat{PCK}$), IPCI = a,
IPKI = b $\Rightarrow$ **A($\widehat{PKC}$) = ?**

A) $\frac{a.b}{4}$ B) $\frac{a \cdot b}{2}$ C) a·b D) 2·a–b E) 4·a–b

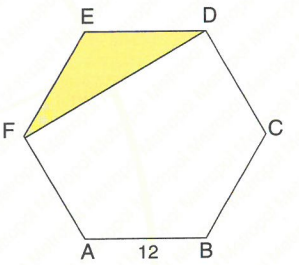
**10.**




ABCD bir beşgendir. / ABCD is a pentagon.
$\Rightarrow$ $\alpha$ = ?

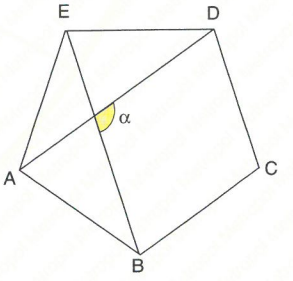
A) 135° B) 120° C) 100° D) 90° E) 75°

**11.** ABCDEF düzgün bir altıgendir.
ABCDEF is a regular hexagon.
IABI = 12 cm
$\Rightarrow$ **A($\widehat{EFD}$) = ? cm$^2$**




A) $36\sqrt{3}$ B) 36 C) $27\sqrt{3}$ D) 48 E) $48\sqrt{3}$

**12.** ABCDE bir düzgün beşgendir.
ABCDE is a regular pentagon.
$\Rightarrow$ $\alpha$ = ?

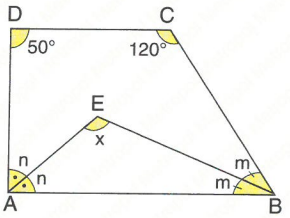



A) 90° B) 108° C) 130° D) 135° E) 140°

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | B | A | B | B | C | C | C | A | C | A | B |

**1.**

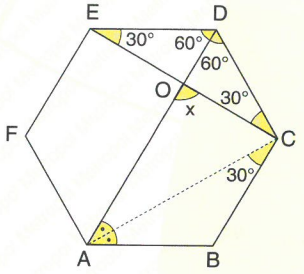



$$m(\widehat{AEB}) = \frac{m(\widehat{D}) + m(\widehat{C})}{2}$$

$$x = \frac{50^2 + 120°}{2} = \frac{170°}{2} = 85°$$

**Yanıt / Answer E**

**2.**




$|ED| = |DC| \Rightarrow m(\widehat{DEC}) = m(\widehat{DCE}) = 30°$

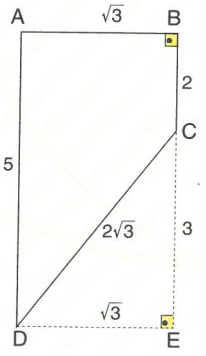
$m(\widehat{EDO}) = m(\widehat{CDO}) = 60°$

$x = 30° + 60° = 90°$

**Yanıt / Answer B**

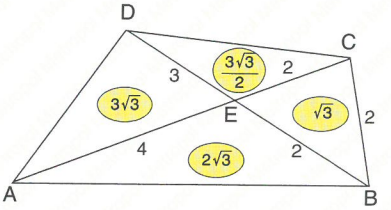
**3.** $A(ABCD) = A(ABDE) - A(CDE)$

$$A(ABCD) = 5\sqrt{3} - \frac{3 \cdot \sqrt{3}}{2} = \frac{7\sqrt{3}}{2}\ cm^2$$




**Yanıt / Answer A**

**4.**




$$A(\widehat{EBC}) = \frac{\sqrt{3}}{4} \cdot 2^2 = \sqrt{3}\ cm^2$$

$$A(\widehat{DEC}) = \frac{3\sqrt{3}}{2}\ cm^2$$

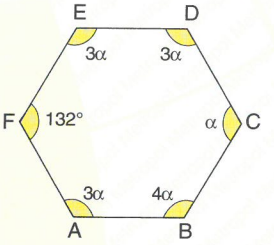
$$A(\widehat{ADE}) = 3\sqrt{3}\ cm^2$$

$$A(\widehat{AEB}) = 2\sqrt{3}\ cm^2$$

$$A(ABCD) = \frac{15\sqrt{3}}{2}\ cm^2$$

**Yanıt / Answer B**

**5.**




$$3\alpha + 3\alpha + \alpha + 4\alpha + 3\alpha + 132° = (6 - 2) \cdot 180°$$

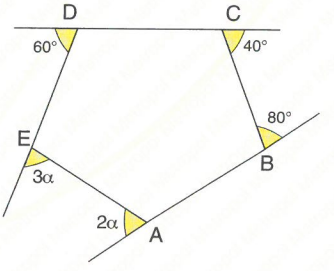
$$14\alpha + 132° = 720°$$

$$14\alpha = 588°$$

$$\alpha = 42°$$

**Yanıt / Answer B**

**6.**

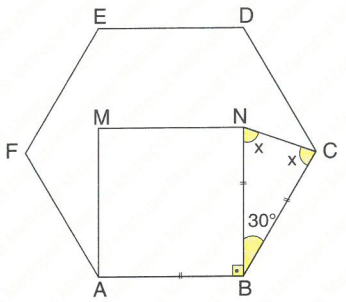



$60° + 40° + 80° + 2\alpha + 3\alpha = 360°$

$\Rightarrow \alpha = 36°$

**Yanıt / Answer C**

**7.**



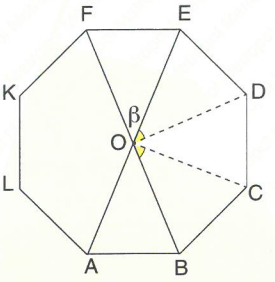

$|AB| = |BC| = |BN|$

$\widehat{BNC} \Rightarrow 2x = 180° - 30° \Rightarrow x = 75°$

**Yanıt / Answer C**

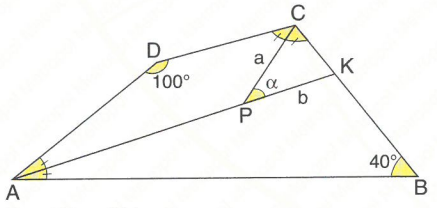
**8.** $\beta = \dfrac{360°}{8} = 45°$

$\alpha = 180° - \beta = 135°$




**Yanıt / Answer C**

**9.**



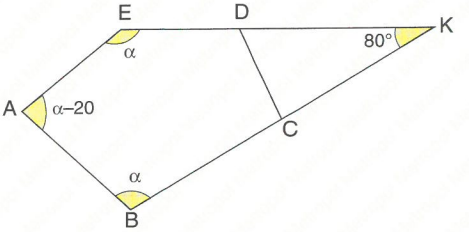

$\alpha = \dfrac{|100 - 40|}{2} = \dfrac{60°}{2} = 30°$

$A(\widehat{PKC}) = \dfrac{1}{2} \cdot a \cdot b \cdot \sin 30$

$= \dfrac{a \cdot b}{4}$

**Yanıt / Answer A**

**10.**

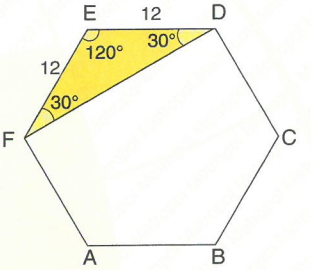



$m(\overset{\square}{ABKE}) \Rightarrow \alpha + \alpha - 20° + \alpha + 80° = 360°$

$3\alpha = 300° \Rightarrow \alpha = 100°$

**Yanıt / Answer C**

**11.**




$m(\widehat{FED}) = 180° - \dfrac{360°}{6} = 120°$

$\Rightarrow A(\widehat{EFD}) = \dfrac{12 \cdot 12}{2} \cdot \sin 120° = 36\sqrt{3}\ cm^2$

**Yanıt / Answer A**

**12.** $m(\widehat{DCB}) = \dfrac{(5-2) \cdot 180°}{5}$

$m(\widehat{DCB}) = 108°$

$BC \parallel AD$

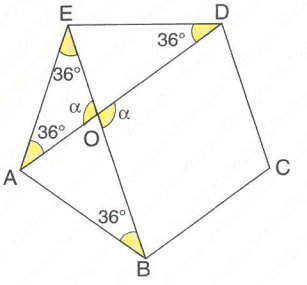
$\Rightarrow m(\widehat{DCB}) + m(\widehat{ADC}) = 180°$

$108 + m(\widehat{ADC}) = 180°$

$m(\widehat{ADC}) = 72°$

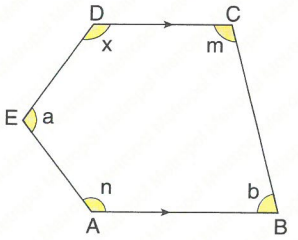
$m(\widehat{EOA}) = \alpha$

$\alpha + 2 \cdot 36 = 180° \Rightarrow \alpha = 108°$



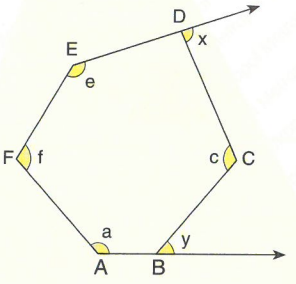

**Yanıt / Answer B**

**1.** [AB] // [DC],
$a - b = 45°$,
$n - m = 5°$
$\Rightarrow$ **$m(\widehat{EDC}) = x = ?$**



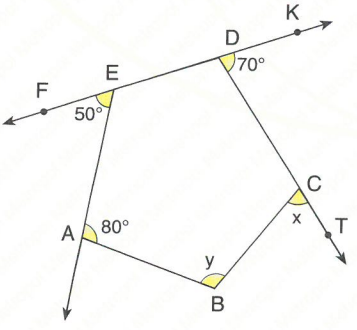

A) 115° B) 120° C) 125° D) 130° E) 135°

**2.** $a + c + e + f = 480°$
$\Rightarrow$ **$x + y = ?$**



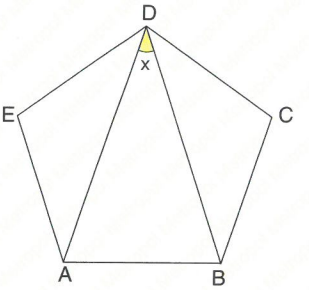

A) 120° B) 125° C) 130° D) 135° E) 140°

**3.** $m(\widehat{FEA}) = 50°$,
$m(\widehat{EAB}) = 80°$,
$m(\widehat{KDC}) = 70°$,
$m(\widehat{ABC}) = y$,
$m(\widehat{BCT}) = x$
$\Rightarrow$ **$y - x = ?$**



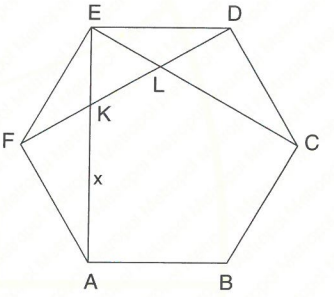

A) 20° B) 25° C) 30° D) 35° E) 40°

**4.** ABCDE bir düzgün beşgendir.
ABCDE is a regular pentagon.
$\Rightarrow$ **$m(\widehat{ADB}) = x = ?$**



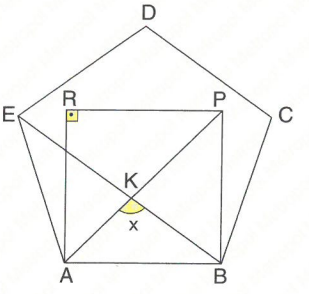

A) 30° B) 34° C) 36° D) 40° E) 45°

**5.** ABCDEF bir düzgün altıgendir.
ABCDEF is a regular hexagon.
$|ECI| = 12$ cm
$\Rightarrow$ **$|AKI| = x = ?$ cm**



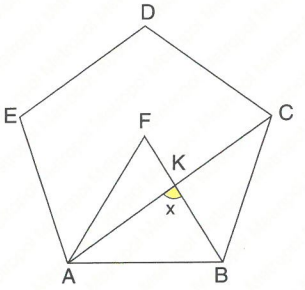

A) 6 B) 7 C) 8 D) 9 E) 10

**6.** ABCDE bir düzgün beşgen, ABPR bir karedir.
ABCDE is a regular pentagon, ABPR is a square.
$\Rightarrow$ **$m(\widehat{AKB}) = x = ?$**




A) 90° B) 91° C) 96° D) 99° E) 101°

**7.**



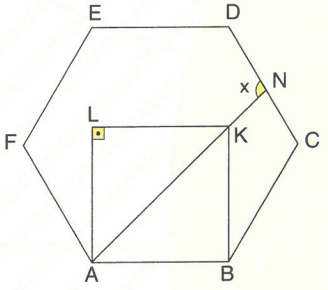

ABCDE bir düzgün beşgen, ABF eşkenar üçgendir.

ABCDE is a regular pentagon, ABF is an equilateral triangle.

$\Rightarrow$ **$m(\widehat{AKB}) = x = ?$**

A) 78° B) 80° C) 82° D) 84° E) 96°

**8.**




ABCDEF bir düzgün altıgen, ABKL bir karedir.

ABCDEF is a regular pentagon, ABKL is a square.

$\Rightarrow$ **$m(\widehat{AND}) = x = ?$**

A) 100° B) 105° C) 110° D) 120° E) 125°

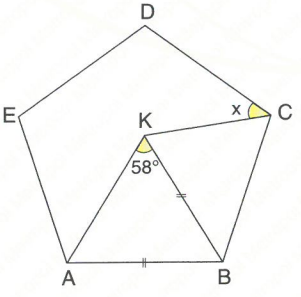
**9.** ABCDE bir düzgün beşgendir.

ABCDE is a regular pentagon.

IKBI = IABI,

$m(\widehat{AKB}) = 58°$

$\Rightarrow$ **$m(\widehat{KCD}) = x = ?$**



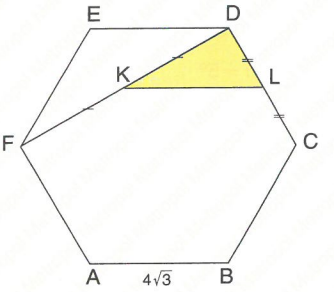

A) 40° B) 44° C) 48° D) 52° E) 56°

**10.** ABCDEF bir düzgün altıgendir.

ABCDEF is a regular hexagon.

IABI = $4\sqrt{3}$ cm

$\Rightarrow$ **$A(\widehat{KLD}) = ?\ cm^2$**

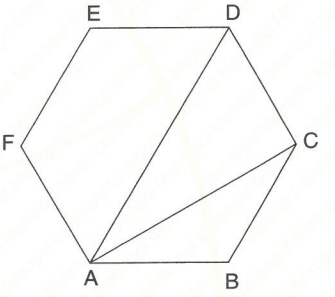



A) $2\sqrt{3}$ B) $3\sqrt{3}$ C) $4\sqrt{3}$ D) $5\sqrt{3}$ E) $6\sqrt{3}$

**11.** ABCDEF bir düzgün altıgendir.

ABCDEF is a regular hexagon.

$\Rightarrow$ **$\dfrac{A(\widehat{ABC})}{A(\widehat{ACD})} = ?$**




A) $\frac{1}{6}$ B) $\frac{1}{5}$ C) $\frac{1}{4}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

**12.** ABCDEF bir düzgün altıgendir.

ABCDEF is a regular hexagon.

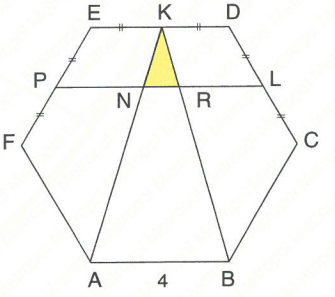
IEPI = IPFI,

IEKI = IKDI,

IDLI = ILCI,

IABI = 4 cm

$\Rightarrow$ **$A(\widehat{KNR}) = ?\ cm^2$**

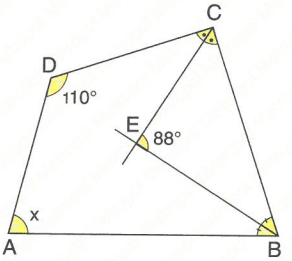



A) $\frac{\sqrt{3}}{2}$ B) $\sqrt{3}$ C) $2\sqrt{3}$ D) $3\sqrt{3}$ E) $4\sqrt{3}$

**YANITLAR / ANSWERS**

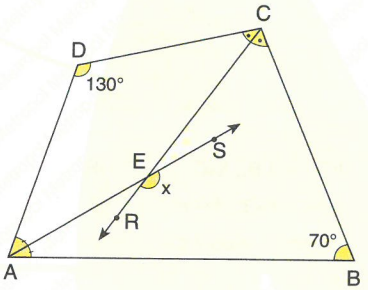
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | A | E | C | C | D | D | B | A | E | E | A |

**1.** $m(\widehat{DCE}) = m(\widehat{ECB})$,
$m(\widehat{CBE}) = m(\widehat{EBA})$,
$m(\widehat{CDA}) = 110°$
$m(\widehat{CEB}) = 88°$
$\Rightarrow$ **$m(\widehat{DAB}) = x = ?$**



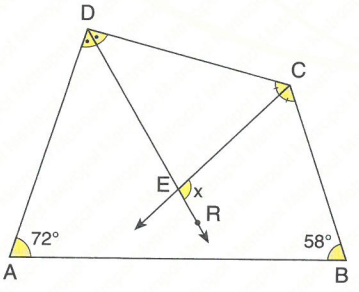

A) 56° B) 60° C) 66° D) 70° E) 72°

**2.** $m(\widehat{DCE}) = m(\widehat{ECB})$,
$m(\widehat{DAE}) = m(\widehat{EAB})$,
$m(\widehat{CDA}) = 130°$
$m(\widehat{CBA}) = 70°$
$\Rightarrow$ **$m(\widehat{SER}) = x = ?$**



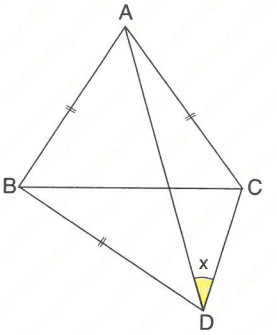

A) 130° B) 135° C) 140° D)145° E) 150°

**3.** $m(\widehat{CDE}) = m(EDA)$,
$m(\widehat{DCE}) = m(\widehat{ECB})$,
$m(\widehat{DAB}) = 72°$
$m(\widehat{CBA}) = 58°$
$\Rightarrow$ **$m(\widehat{CER}) = x = ?$**



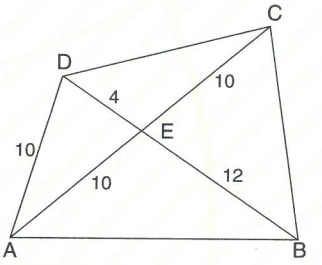

A) 110° B) 115° C) 120° D)125° E) 130°

**4.** $|AB| = |AC| = |BC|$,
$|BC| = |BD|$
$\Rightarrow$ **$m(\widehat{ADC}) = x = ?$**



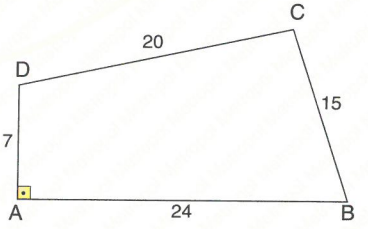

A) 15° B) 20° C) 25° D) 30° E) 35°

**5.** $|AE| = 10$ cm,
$|EC| = 10$ cm,
$|AD| = 10$ cm,
$|EB| = 12$ cm,
$|DE| = 4$ cm
$\Rightarrow$ **$A(ABCD) = ?\ cm^2$**




A) $48\sqrt{6}$ B) $54\sqrt{6}$ C) $64\sqrt{6}$ D) $72\sqrt{6}$ E) $96\sqrt{6}$

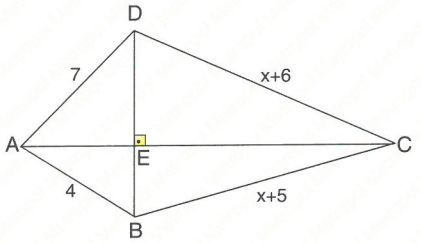
**6.**




$[DA] \perp [AB]$, $|AB| = 24$ cm, $|BC| = 15$ cm, $|CD| = 20$ cm,
$|DA| = 7$ cm $\Rightarrow$ **$A(ABCD) = ?\ cm^2$**

A) 234 B) 252 C) 264 D) 272 E) 284

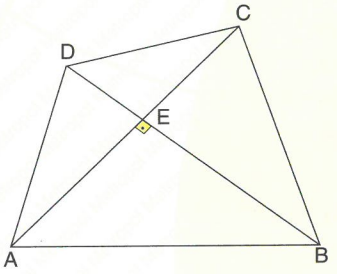
**7.**




[DB] ⊥ [AC], IDCI = x + 6, IBCI = x + 5, IABI = 4 cm,
IADI = 7 cm ⇒ **x = ? cm**

A) 8 B) 9 C) 10 D) 11 E) 12

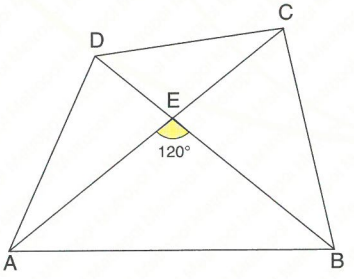
**8.**




[AC] ⊥ [DB], IACI = 12 cm, IDBI = 10 cm
⇒ **A(ABCD) = ? cm²**

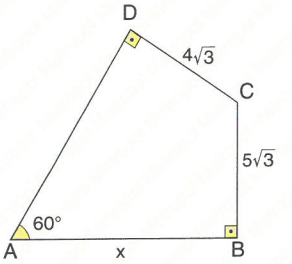
A) 30 B) 40 C) 60 D) 80 E) 120

**9.** $m(\widehat{AEB}) = 120°$,
IACI = 8 cm,
IDBI = 10 cm
⇒ **A(ABCD) = ? cm²**



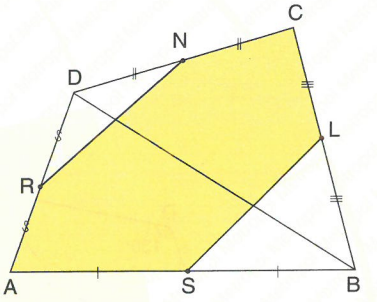

A) $20\sqrt{3}$ B) $25\sqrt{3}$ C) $30\sqrt{3}$ D) $35\sqrt{3}$ E) $40\sqrt{3}$

**10.** [CD] ⊥ [AD],
[CB] ⊥ [AB],
$m(\widehat{DAB}) = 60°$,
IDCI = $4\sqrt{3}$ cm
IBCI = $5\sqrt{3}$ cm
⇒ **IABI = x = ? cm**




A) 9 B) 10 C) 11 D) 12 E) 13

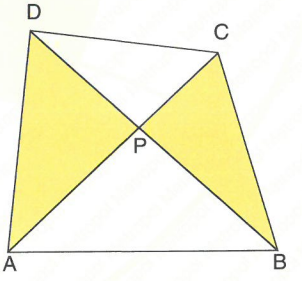
**11.**




ICLI = ILBI, INCI = INDI, IRDI = IRAI,
ISAI = ISBI, A(ABCD) = 56 br²(u²)
⇒ **taralı alan / the shaded area = ? br²(u²)**

A) 28 B) 32 C) 36 D) 42 E) 48

**12.**




3·IDPI = 2·IPBI, 4·IPCI = IAPI ⇒ $\dfrac{A(\widehat{PBC})}{A(\widehat{APD})} = ?$

A) $\frac{3}{8}$ B) $\frac{1}{2}$ C) $\frac{2}{3}$ D) $\frac{3}{4}$ E) $\frac{2}{7}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | E | B | D | C | A | D | C | A | E | D | A |

# BÖLÜM CHAPTER 8

## TARİHSEL NOT / HISTORICAL NOTE

### Gerolamo Cardano [1501 – 1576]

İtalyan Rönesans matematikçi, fizikçi, astrolog ve hekimdir. Cardano, Milano'da (1539) Practica Arithmetica'yı basıma hazırladı. Cardano, Tartaglia'yı davet etti ve birçok ısrardan sonra ondan 3. dereceden denklemin sonucunu nasıl çözülebileceğini öğrendi. Tartaglia, Cardano'ya 3. dereceden denklemleri nasıl çözeceğini gösterdikten sonra Cardano kendi öğrencisi olan Lodovico Ferrari'yi 4. dereceden denklemleri çözmesi için cesaretlendirdi.

Italian Renaissance mathematician, physicist, astronomer and physician. Cardano, in Milano (1539), prepared Practica Arithmetica for printing. Cardano invited Tartaglia and after many insistences learned how to solve the 3rd degree equations. After Tartaglia showed Cardano how to solve the 3rd degree equations, Cardano encouraged Lodovico Ferrari, his student, to solve the 4th degree equations.

# PARALELKENAR ve EŞKENAR DÖRTGEN
# PARALLELOGRAM and EQUILATERAL QUADRANGLES

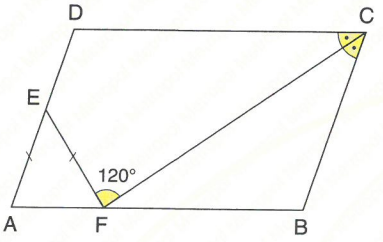
**Bu bölüm 84 çözümlü test sorusu ve 36 test sorusu içermektedir.**

**This chapter includes 84 test questions with solutions and 36 test questions.**

**BÖLÜM / CHAPTER 8**

**PARALELKENAR VE EŞKENAR DÖRTGEN / PARALLELOGRAM and EQUILATERAL QUADRANGLES**

**1.**



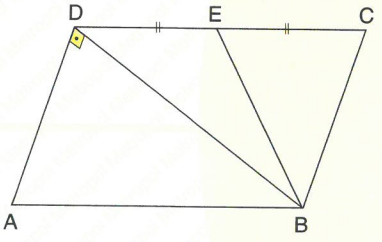

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$m(\widehat{EFC}) = 120°$, $|AE| = |FE|$, $m(\widehat{DCF}) = m(\widehat{FCB})$

$\Rightarrow$ **$m(\widehat{FBC}) = ?$**

A) 100° B) 110° C) 120° D) 130° E) 140°

**2.**



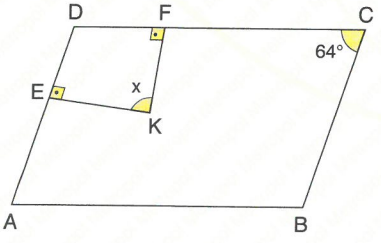

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$[AD] \perp [BD]$, $|DE| = |EC|$, $|AB| = 2\cdot|BC|$

$\Rightarrow$ **$m(\widehat{DCB}) = ?$**

A) 40° B) 50° C) 60° D) 70° E) 80°

**3.**



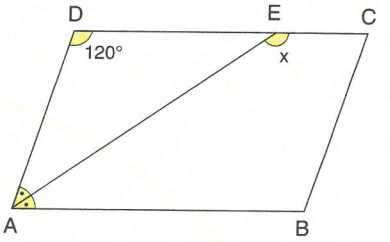

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$m(\widehat{DCB}) = 64°$, $[KE] \perp [AD]$, $[KF] \perp [DC]$

$\Rightarrow$ **$m(\widehat{EKF}) = x = ?$**

A) 52° B) 56° C) 60° D) 64° E) 68°

**4.**



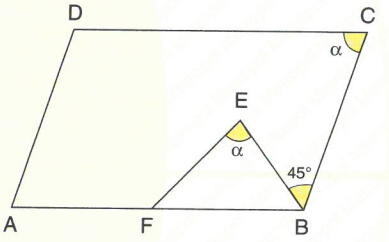

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$m(\widehat{ADC}) = 120°$, $m(\widehat{DAE}) = m(\widehat{EAB})$

$\Rightarrow$ **$m(\widehat{AEC}) = x = ?$**

A) 120° B) 130° C) 140° D) 150° E) 160°

**5.**



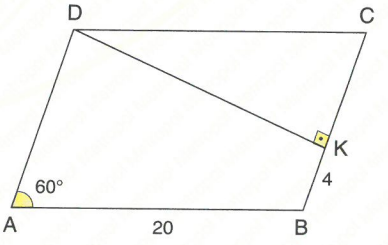

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$m(\widehat{EBC}) = 45°$, $m(\widehat{DCB}) = m(\widehat{FEB}) = \alpha$

$\Rightarrow$ **$m(\widehat{AFE}) = ?$**

A) 105° B) 115° C) 125° D) 135° E) 145°

**6.**



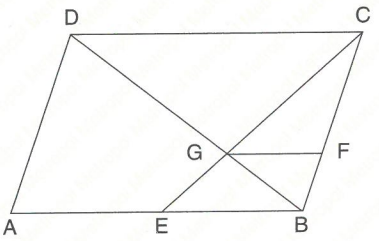

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$[DK] \perp [CB]$, $m(\widehat{DAB}) = 60°$, $|KB| = 4$ cm, $|AB| = 20$ cm

$\Rightarrow$ **Çevre / The perimeter (ABCD) = ? cm**

A) 60 B) 64 C) 68 D) 72 E) 76

**7.**



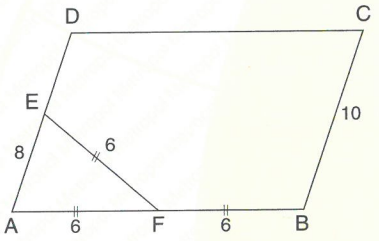

ABCD bir paralelkenardır. / ABCD is a parallelogram.

[GF] // [AB], $\frac{|GF|}{|BF|} = 2$, , |DC| = 15 cm

⇒ **Çevre / The perimeter (ABCD) = ? cm**

A) 28 B) 32 C) 36 D) 40 E) 45

**8.**



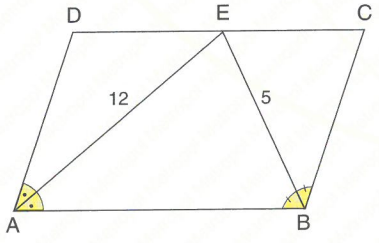

ABCD bir paralelkenardır. / ABCD is a parallelogram.

|EF| = |AF| = |BF| = 6 cm, |AE| = 8 cm, |BC| = 10 cm

⇒ **A(ABCD) = ? cm²**

A) $20\sqrt{5}$ B) $24\sqrt{5}$ C) $32\sqrt{5}$ D) $36\sqrt{5}$ E) $40\sqrt{5}$

**9.**




ABCD bir paralelkenardır. / / ABCD is a parallelogram.

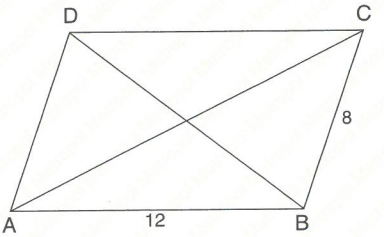
$m(\widehat{DAE}) = m(\widehat{EAB})$, $m(\widehat{EBA}) = m(\widehat{EBC})$,

|AE| = 12 cm, |EB| = 5 cm

⇒ **Çevre / The perimeter (ABCD) = ? cm**

A) 12 B) 26 C) 33 D) 39 E) 52

**10.**

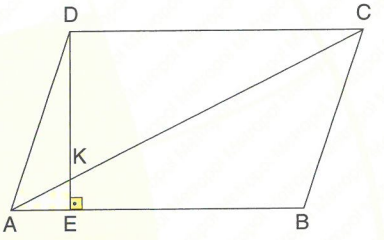



ABCD bir paralelkenardır. / ABCD is a parallelogram.

|AB| = 12 cm, |BC| = 8 cm ⇒ **$|AC|^2 + |BD|^2$ = ? cm²**

A) 710 B) 512 C) 416 D) 306 E) 250

**11.**

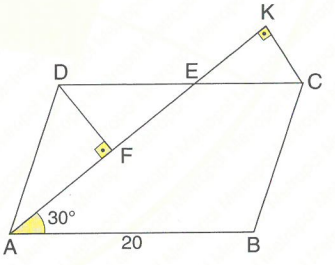



ABCD bir paralelkenardır. / ABCD is a parallelogram.

|KE| = 3 cm, |AE| = 4 cm, |KC| = 15 cm ⇒ **|EB| = ? cm**

A) 8 B) 7 C) 6 D) 5 E) 4

**12.**




ABCD bir paralelkenardır. / ABCD is a parallelogram.

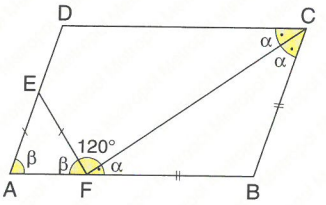
$m(\widehat{KAB}) = 30°$, |AB| = 20 cm ⇒ **|CK| + |DF| = ? cm**

A) 5 B) 8 C) 10 D) 12 E) 15

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | C | D | D | D | C | E | E | D | C | A | C |

1.

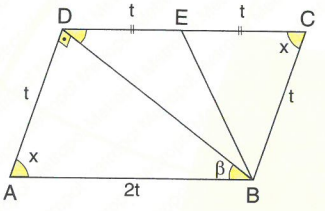



$\left.\begin{array}{l}\alpha+\beta=60^\circ\\ 2\alpha=\beta\end{array}\right\}\Rightarrow \alpha=20^\circ$

$\Rightarrow m(\widehat{FBC}) = 140^\circ$

**Yanıt / Answer E**

2.

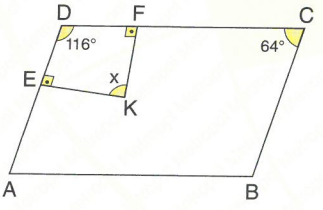



$\widehat{ADB}$ bir dik üçgendir. / $\widehat{ADB}$ is a right triangle.

$|AB| = 2\cdot|AD| \Rightarrow \beta = 30^\circ$ , $x = 60^\circ$

**Yanıt / Answer C**

3.




$m(\widehat{C}) + m(\widehat{D}) = 180^\circ$

$64^\circ + m(\widehat{D}) = 180^\circ$

$m(\widehat{D}) = 116^\circ$

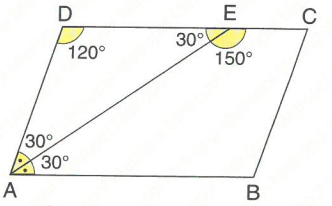
$m(\widehat{D}) + m(\widehat{EKF}) = 180^\circ$

$116^\circ + m(\widehat{EKF}) = 180^\circ$

$m(\widehat{EKF}) = 64^\circ$

**Yanıt / Answer D**

4.




$m(\widehat{D}) + m(\widehat{A}) = 180^\circ$

$120^\circ + m(\widehat{A}) = 180^\circ$

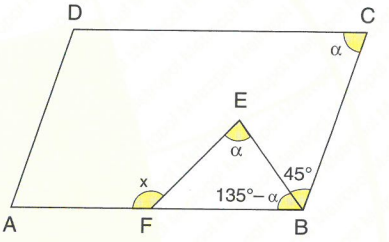
$m(\widehat{A}) = 60^\circ$

$m(\widehat{EAB}) = m(\widehat{EAD}) = 30^\circ$

$\Rightarrow m(\widehat{AEC}) = 150^\circ$

**Yanıt / Answer D**

5.




$m(\widehat{B}) = 180^\circ - \alpha$

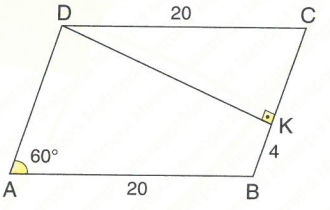
$m(\widehat{EBF}) = 180^\circ - \alpha - 45^\circ = 135^\circ - \alpha$

$x = \alpha + 135^\circ - \alpha$

$x = 135^\circ$

**Yanıt / Answer D**

6.



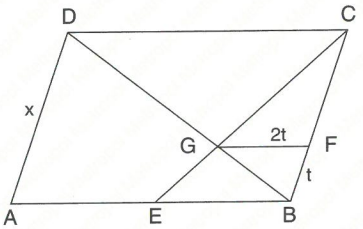

$\widehat{DKC}$ (30°, 90°, 60°)

$|DC| = 20$ cm $\Rightarrow |DK| = 10$ cm

Çevre / The perimeter (ABCD) = 2·(20 + 14) = 68 cm

**Yanıt / Answer C**

**7.**



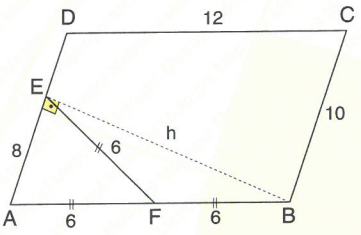

$\widehat{BFG} \sim \widehat{BDC} \Rightarrow \frac{|BF|}{|BC|} = \frac{|GF|}{|DC|}$

$\frac{t}{x} = \frac{2t}{15} \Rightarrow x = \frac{15}{2}$ cm.

Çevre / The perimeter (ABCD) $= 2 \cdot \left(15 + \frac{15}{2}\right) = 45$ cm

**Yanıt / Answer E**

**8.**




$|EF| = |AF| = |FB| \Rightarrow m(\widehat{BEA}) = 90°$

$12^2 = 8^2 + h^2$ [ Pythgor ]

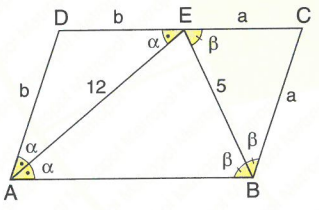
$h = 4\sqrt{5}$ cm

$A(ABCD) = |EB| \cdot |AD|$

$= 4\sqrt{5} \cdot 10 = 40\sqrt{5}$ cm$^2$

**Yanıt / Answer E**

**9.**




$2\alpha + 2\beta = 180°$

$\alpha + \beta = 90°$

$m(\widehat{AEB}) = 90°$

$|AB|^2 = 12^2 + 5^2$ [ Pythgor ]

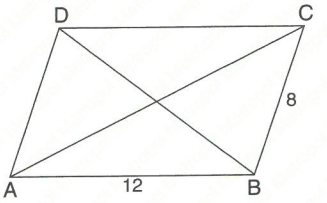
$|AB| = 13$ cm

Çevre / The perimeter (ABCD) $= 3 \cdot (a + b)$

$= 3 \cdot 13 = 39$ cm

**Yanıt / Answer D**

**10.**



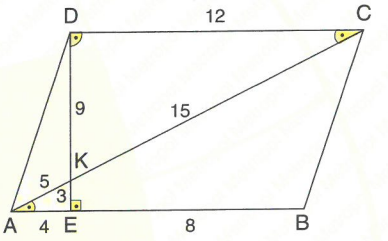

$|AC|^2 + |BD|^2 = 2 \cdot (|AB|^2 + |BC|^2)$

$|AC|^2 + |BD|^2 = 2 \cdot (144 + 64) = 416$ cm$^2$

$= 2 \cdot (208) = 416$ cm$^2$

**Yanıt / Answer C**

**11.**



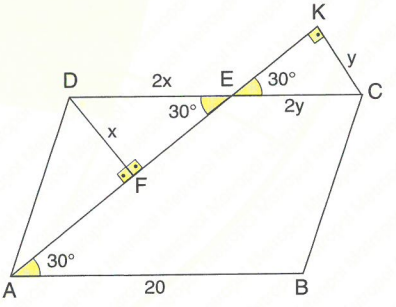

$\widehat{AKE} \sim \widehat{CKD} \Rightarrow \frac{|AK|}{|KC|} = \frac{|AE|}{|DC|}$

$\frac{5}{15} = \frac{4}{|DC|} \Rightarrow |DC| = 12$ cm

$|EB| = 12 - 4 = 8$ cm

**Yanıt / Answer A**

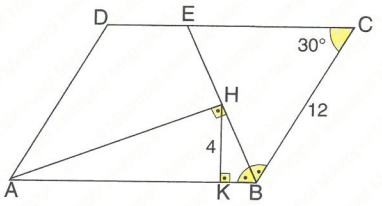
**12.**




$2x + 2y = 20 \Rightarrow x + y = 10$ cm

**Yanıt / Answer C**

**1.**




ABCD bir paralelkenardır. / ABCD is a parallelogram.

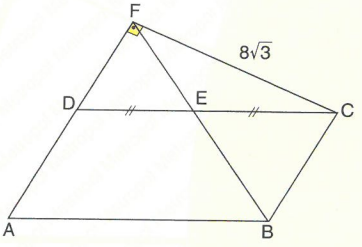
$m(\widehat{BCD}) = 30°$, $m(\widehat{ABE}) = m(\widehat{EBC})$,

$[AH] \perp [EB]$, $[HK] \perp [AB]$, $|BC| = 12$ cm, $|HK| = 4$ cm

$\Rightarrow$ **Çevre/ The perimeter (ABCD) = ? cm**

A) 48 B) 56 C) 60 D) 72 E) 96

**2.**



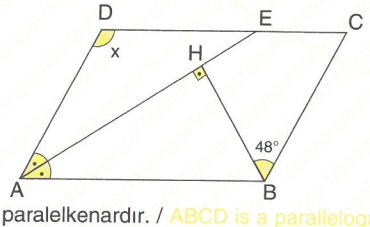

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$[AF] \perp [FC]$, $|DE| = |EC|$, $|AB| = 2 \cdot |AD|$,

$|FC| = 8\sqrt{3}$ cm $\Rightarrow$ **A(ABCD) = ? cm²**

A) $64\sqrt{3}$ B) $72\sqrt{3}$ C) 96 D) 124 E) 196

**3.**



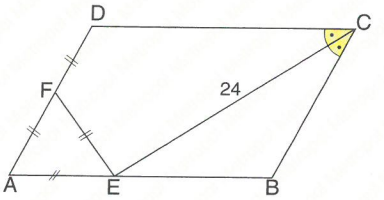

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$m(\widehat{DAE}) = m(\widehat{EAB})$, $[BH] \perp [AE]$, $m(\widehat{HBC}) = 48°$

$\Rightarrow$ **$m(\widehat{ADC}) = x = ?$**

A) 72° B) 78° C) 82° D) 84° E) 96°

**4.**



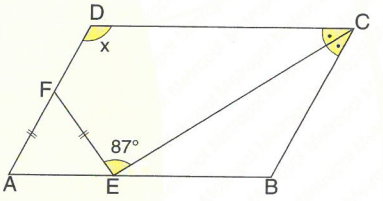

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$m(\widehat{DCE}) = m(\widehat{ECB})$, $|AE| = |AF| = |EF| = |DF|$,

$|CE| = 24$ cm $\Rightarrow$ **A(ABCD) = ? cm²**

A) $144\sqrt{3}$ B) $196\sqrt{3}$ C) $216\sqrt{3}$ D) 288 E) 324

**5.**



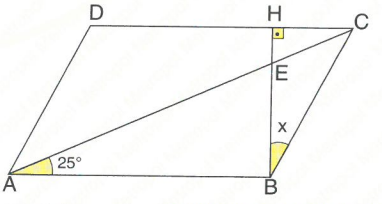

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$m(\widehat{DCE}) = m(\widehat{ECB})$, $|FA| = |FE|$, $m(\widehat{FEC}) = 87°$

$\Rightarrow$ **$m(\widehat{ADC}) = x = ?$**

A) 108 B) 112 C) 114 D) 116 E) 118

**6.**



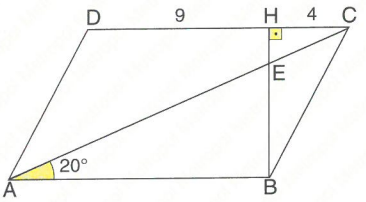

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$[BH] \perp [DC]$, $[AC] \cap [BH] = \{E\}$, $|AE| = 2 \cdot |BC|$,

$m(\widehat{CAB}) = 25° \Rightarrow$ **$m(\widehat{CBH}) = x = ?$**

A) 10° B) 15° C) 20° D) 25° E) 30°

**7.**



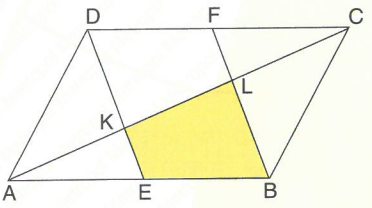

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$[BH] \perp [DC]$, $2 \cdot |BC| = |AE|$, $|DH| = 9$ cm, $|HC| = 4$ cm,

$m(\widehat{CAB}) = 20° \Rightarrow$ **A(ABCD) = ? cm²**

A) 72 B) $66\sqrt{2}$ C) $56\sqrt{3}$ D) $52\sqrt{3}$ E) 48

**8.**




ABCD bir paralelkenardır. / ABCD is a parallelogram.

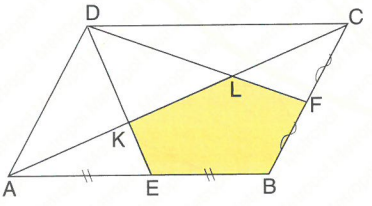
$|AE| = |EB|$, $|DF| = |FC|$, $[AC] \cap [DE] = \{K\}$,

$[AC] \cap [BF] = \{L\}$, $A(EBLK) = 36$ cm²

$\Rightarrow$ **A(ABCD) = ? cm²**

A) 84 B) 96 C) 108 D) 124 E) 144

**9.**



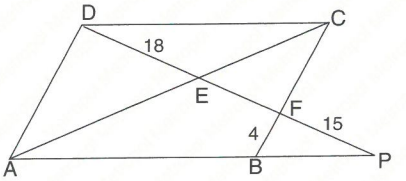

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$|AE| = |EB|$, $|BF| = |FC|$, $A(ABCD) = 96$ cm²

$\Rightarrow$ **A(EBFLK) = ? cm²**

A) 16 B) 24 C) 28 D) 32 E) 36

**10.**



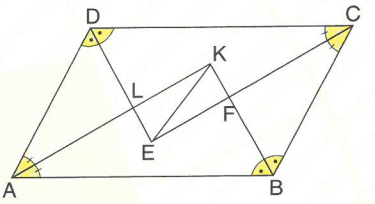

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$|DE| = 18$ cm, $|FP| = 15$ cm, $2 \cdot |BF| = |FC| = 8$ cm

$\Rightarrow$ **|EF| = ? cm**

A) 8 B) 12 C) 15 D) 16 E) 18

**11.**



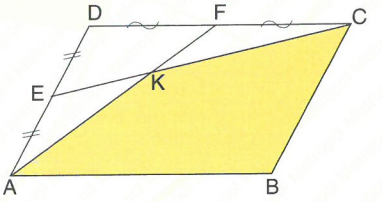

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$|AB| > |BC|$, $|AB| + |BC| = 28$ cm, $|EK| = 4$ cm

$\Rightarrow \dfrac{|BC|}{|AB|} = ?$

A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) $\frac{2}{3}$ D) $\frac{3}{4}$ E) $\frac{5}{8}$

**12.**




ABCD bir paralelkenardır. / ABCD is a parallelogram.

$|AE| = |ED|$, $|DF| = |FC|$, $[AF] \cap [CE] = \{K\}$,

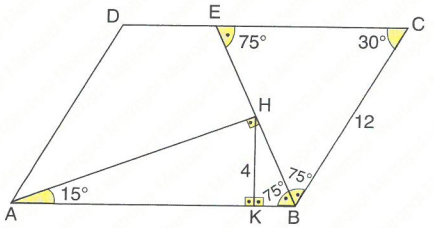
$A(ABCD) = 108$ cm² $\Rightarrow$ **A(AKCB) = ? cm²**

A) 54 B) 56 C) 62 D) 68 E) 72

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | A | E | A | E | B | D | E | D | B | D | E |

1.




$\widehat{AHB}$ (15°, 90°, 75°)

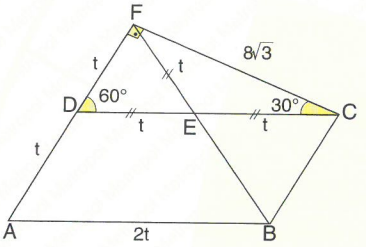
$|AB| = 4 \cdot |HK|$ [ Euclid ]

$= 4 \cdot 4 = 16$ cm

$\Rightarrow$ Çevre / The perimeter (ABCD) $= 2 \cdot (12 + 16) = 56$ cm

**Yanıt / Answer B**

2.




$\widehat{DFC}$ (30°, 60°, 90°)

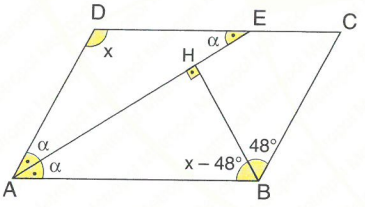
$|CF| = |FD| \cdot \sqrt{3} \Rightarrow |FD| = 8$ cm

$\frac{|DE|}{|AB|} = \frac{t}{2t} = \frac{1}{2} \Rightarrow |FD| = |AD| = t = 8$ cm

$A(ABCD) = 8 \cdot 8\sqrt{3} = 64\sqrt{3}$ cm$^2$

**Yanıt / Answer A**

3.

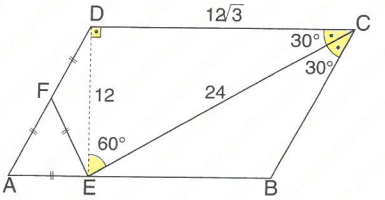



$\alpha + x - 48° = 90°$

$\left.\begin{array}{l}\alpha + x = 138° \\ 2\alpha + x = 180°\end{array}\right\} \Rightarrow \alpha = 42°$ ve (and) $x = 96°$

**Yanıt / Answer E**

4.



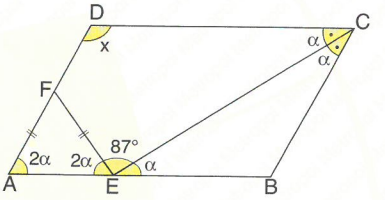

$\widehat{EDC}$ (60°, 90°, 30°)

$|CE| = 24$ cm $\Rightarrow |DE| = 12$ cm, $|DC| = 12\sqrt{3}$ cm

$A(ABCD) = 12 \cdot 12\sqrt{3} = 144\sqrt{3}$ cm$^2$

**Yanıt / Answer A**

5.




$3\alpha + 87° = 180°$

$3\alpha = 93°$

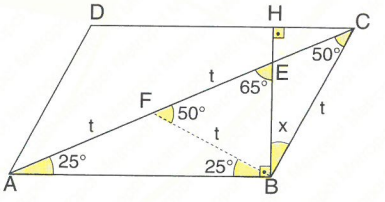
$\alpha = 31°$

$x + 2\alpha = 180°$

$x = 118°$

**Yanıt / Answer E**

6.




$|AF| = |FE| = |FB| = t \Rightarrow |FB| = |BC| = t$

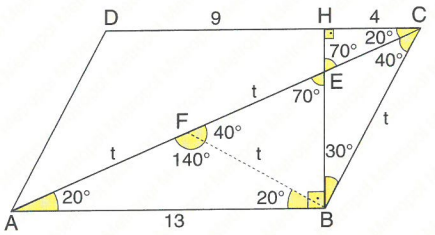
$m(\widehat{CFB}) = m(\widehat{FCB}) = 50°$

$x + 50° = 65°$

$x = 15°$

**Yanıt / Answer B**

**7.**




$m(\widehat{AFB}) = 140° \Rightarrow 70° = 40° + m(\widehat{HBC})$

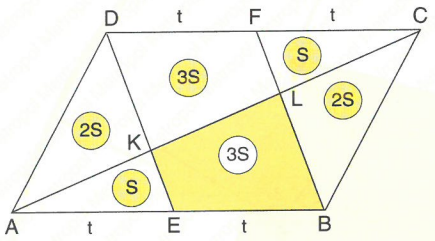
$\Rightarrow m(\widehat{HBC}) = 30°$

$t = 8$ cm, $|BH| = 4\sqrt{3}$ cm

$A(ABCD) = 13 \cdot 4\sqrt{3} = 52\sqrt{3}$ cm$^2$

**Yanıt / Answer D**

**8.**




$A(EBKL) = 36$ cm$^2$

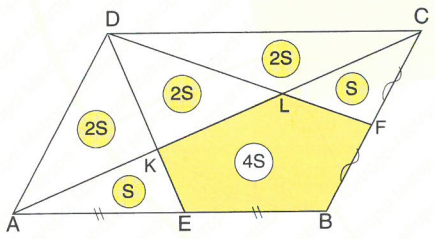
$3 \cdot S = 36$ cm$^2$

$S = 12$ cm$^2$

$A(ABCD) = 12 \cdot S = 12 \cdot 12 = 144$ cm$^2$

**Yanıt / Answer E**

**9.**




$A(ABCD) = 12 \cdot S$

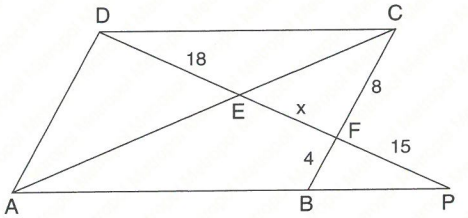
$96 = 12 \cdot S$

$S = 8$ cm$^2$

$A(EBFLK) = 32$ cm$^2$

**Yanıt / Answer D**

**10.**



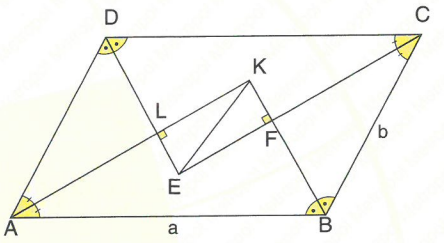

$\widehat{FCD} \sim \widehat{FBP}$

$\frac{|CF|}{|FB|} = \frac{|FD|}{|FP|} \Rightarrow \frac{8}{4} = \frac{18+x}{15}$

$x = 12$ cm

**Yanıt / Answer B**

**11.**




$a + b = 28$ cm

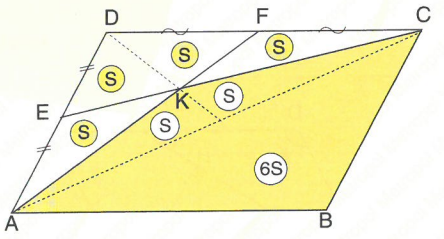
$|EK| = |a - b| \Rightarrow |a - b| = 4$ cm

$a = 16$ cm, $b = 12$ cm

$\Rightarrow \frac{|BC|}{|AB|} = \frac{b}{a} = \frac{3}{4}$

**Yanıt / Answer D**

**12.**




K noktası ADC üçgeninin ağırlık merkezidir.

Point K is center of gravity in the ADC triangle.

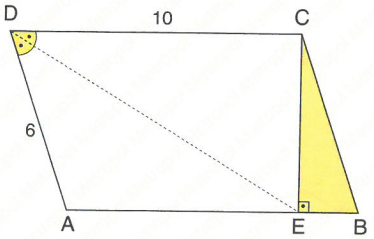
$A(ABCD) = 12S = 108$

$S = 9$ cm$^2$

$\Rightarrow A(AKCB) = 8 \cdot S = 8 \cdot 9 = 72$ cm$^2$

**Yanıt / Answer E**

**1.**



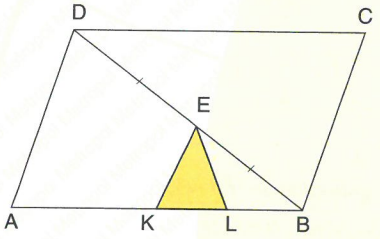

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$m(\widehat{ADE}) = m(\widehat{EDC})$, $|DC| = 10$ cm, $|AD| = 6$ cm

$\Rightarrow$ **$A(\widehat{ECB}) = ?$ cm$^2$**

A) $\sqrt{5}$ B) $3\sqrt{5}$ C) $4\sqrt{5}$ D) $5\sqrt{5}$ E) $6\sqrt{5}$

**2.**



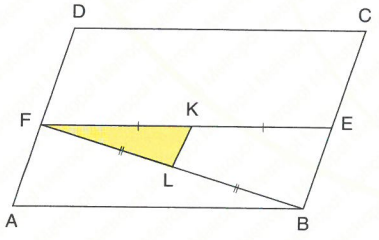

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$|AK| = 2\cdot|KL| = 2\cdot|LB|$, $|DE| = |EB|$,

$A(ABCD) = 120$ cm$^2$ $\Rightarrow$ **$A(\widehat{EKL}) = ?$ cm$^2$**

A) 5 B) $\frac{15}{2}$ C) 10 D) $\frac{25}{2}$ E) 15

**3.**



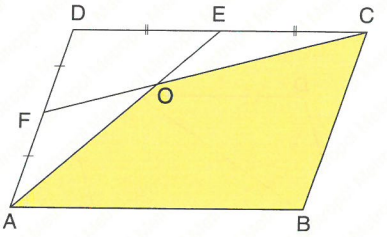

ABCD bir paralelkenardır. / ABCD is a parallelogram.

[FE] // [AB], $|DF| = 3\cdot|FA|$, $|FK| = |KE|$, $|FL| = |LB|$,

$\Rightarrow$ **$\dfrac{A(\widehat{FKL})}{A(ABCD)} = ?$**

A) $\frac{1}{28}$ B) $\frac{1}{30}$ C) $\frac{1}{32}$ D) $\frac{1}{36}$ E) $\frac{1}{40}$

**4.**



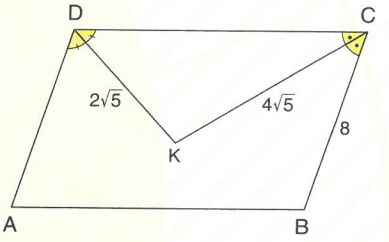

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$|DE| = |EC|$, $|DF| = |FA|$, $A(DFOE) = 12$ cm$^2$

$\Rightarrow$ **$A(ABCO) = ?$ cm$^2$**

A) 48 B) 56 C) 64 D) 72 E) 80

**5.**



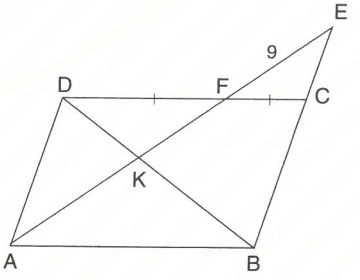

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$m(\widehat{ADK}) = m(\widehat{KDC})$, $m(\widehat{DCK}) = m(\widehat{KCB})$, $|DK| = 2\sqrt{5}$ cm,

$|KC| = 4\sqrt{5}$, $|BC| = 8$ cm $\Rightarrow$ **$A(ABCD) = ?$ cm$^2$**

A) 64 B) 60 C) 56 D) 50 E) 48

**6.**

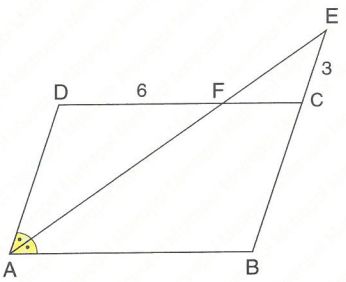



ABCD bir paralelkenardır. / ABCD is a parallelogram.

$|DF| = |FC|$, $|EF| = 9$ cm $\Rightarrow$ **$|AK| = ?$ cm**

A) 4 B) 5 C) 6 D) 7 E) 8

**7.**



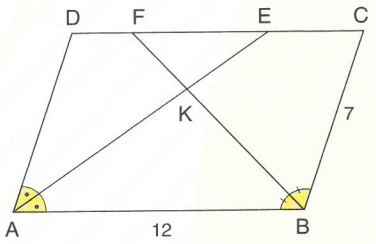

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$m(\widehat{DAF}) = m(\widehat{FAB})$, $|DF| = 6$ cm, $|EC| = 3$ cm

$\Rightarrow$ **Çevre / The perimeter (ABCD) = ? cm**

A) 24 B) 28 C) 30 D) 36 E) 40

**8.**



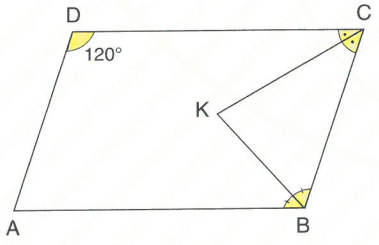

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$m(\widehat{DAE}) = m(\widehat{EAB})$, $m(\widehat{CBF}) = m(\widehat{FBA})$,

$|BC| = 7$ cm, $|AB| = 12$ cm $\Rightarrow$ $\mathbf{\frac{|EK|}{|KA|} = ?}$

A) $\frac{1}{4}$ B) $\frac{1}{6}$ C) $\frac{5}{15}$ D) $\frac{1}{2}$ E) $\frac{7}{12}$

**9.**




ABCD bir paralelkenardır. / ABCD is a parallelogram.

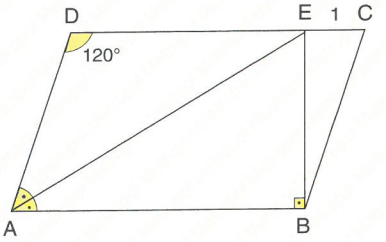
$m(\widehat{DCK}) = m(\widehat{KCB})$ , $m(\widehat{ABK}) = m(\widehat{KBC})$,

$m(\widehat{ADC}) = 120°$, $2 \cdot |BC| = |AB|$, $|KB| = 4$ cm

$\Rightarrow$ **Çevre / The perimeter (ABCD) = ? cm**

A) 48 B) 36 C) 30 D) 24 E) 20

**10.**



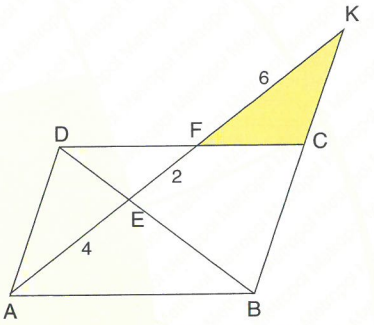

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$m(\widehat{DAE}) = m(\widehat{EAB})$ , $m(\widehat{ADE}) = 120°$, $[EB] \perp [AB]$,

$|EC| = 1$ cm $\Rightarrow$ **Çevre / The perimeter (ABCD) = ? cm**

A) 6 B) 10 C) 14 D) 18 E) 22

**11.**



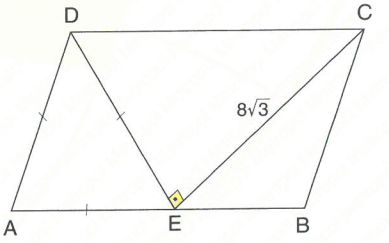

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$|AE| = 4$ cm, $|FE| = 2$ cm, $|FK| = 6$ cm,

$A(\widehat{DEF}) = 10\ cm^2 \Rightarrow$ **$A(\widehat{FKC}) = ?\ cm^2$**

A) 10 B) 15 C) 20 D) 25 E) 30

**12.**




ABCD bir paralelkenardır. / ABCD is a parallelogram.

$[DE] \perp [EC]$, $|AD| = |DE| = |AE|$, $|EC| = 8\sqrt{3}$ cm

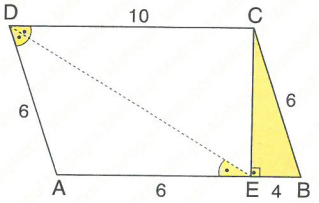
$\Rightarrow$ **$A(ABCD) = ?\ cm^2$**

A) $72\sqrt{3}$ B) $64\sqrt{3}$ C) $60\sqrt{3}$ D) $56\sqrt{3}$ E) $48\sqrt{3}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | B | C | A | A | C | C | B | A | B | E | B |

**1.**




$|EB| = 10 - 6 = 4$ cm

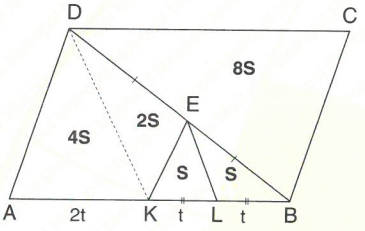
$|CE| = \sqrt{6^2 - 4^2}$ [Pythagor]

$|CE| = 2\sqrt{5}$ cm

$A(\widehat{ECB}) = \dfrac{4 \cdot 2\sqrt{5}}{2} = 4\sqrt{5}$ cm$^2$

**Yanıt / Answer C**

**2.**

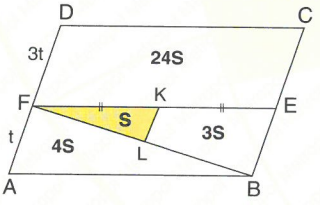



$A(ABCD) = 16.S = 120$ cm$^2$

$A(\widehat{EKL}) = S = \dfrac{120}{16} = \dfrac{15}{2}$ cm$^2$

**Yanıt / Answer B**

**3.**




[KL] // [BE]

$A(\widehat{FLK}) = S \Rightarrow A(KLBE) = 3 \cdot S$

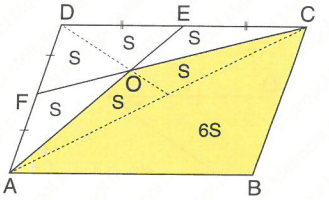
$A(\widehat{ABF}) = 4 \cdot S$

$A(FECD) = 24 \cdot S$

$\dfrac{A(\widehat{FKL})}{A(ABCD)} = \dfrac{S}{32.S} = \dfrac{1}{32}$

**Yanıt / Answer C**

**4.**




O noktası ADC üçgeninin ağırlık merkezidir.

Point O is the center of gravity in the ADC triangle.

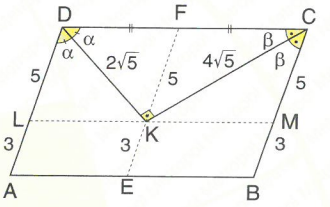
$A(DFOE) = 12$ cm$^2$

$2 \cdot S = 12 \Rightarrow S = 6$ cm$^2$

$A(ABCO) = 8 \cdot S = 8 \cdot 6 = 48$ cm$^2$

**Yanıt / Answer A**

**5.**




$A(LMCD) = 2 \cdot A(\widehat{DKC})$

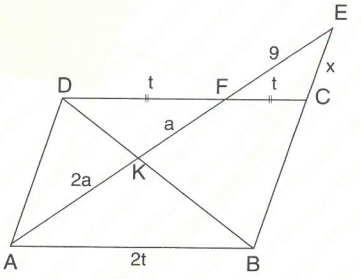
$A(LMCD) = (2\sqrt{5}) \cdot (4\sqrt{5}) = 40$ cm$^2$

$\dfrac{A(LMCD)}{A(ABCD)} = \dfrac{5}{8}$

$\dfrac{40}{A(ABCD)} = \dfrac{5}{8} \Rightarrow A(ABCD) = 64$ cm$^2$

**Yanıt / Answer A**

**6.**




$\widehat{DKF} \sim \widehat{BKA} \Rightarrow \dfrac{|FK|}{|AK|} = \dfrac{|DF|}{|AB|} \Rightarrow |AK| = 2 \cdot |FK|$

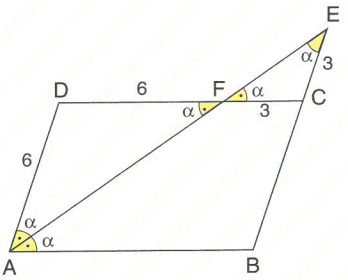
$\widehat{EFC} \sim \widehat{EAB}$

$\dfrac{|FC|}{|AB|} = \dfrac{|EF|}{|EA|} \Rightarrow \dfrac{t}{2t} = \dfrac{9}{9 + 3a} \Rightarrow a = 3$ cm

$\Rightarrow |AK| = 2 \cdot a = 2 \cdot 3 = 6$ cm

**Yanıt / Answer C**

**7.**



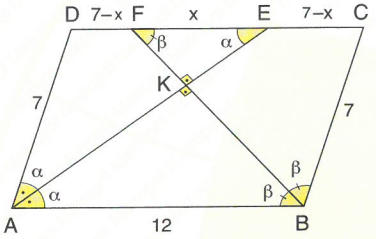

$m(\widehat{DAF}) = m(\widehat{DFA}) \Rightarrow |DA| = |DF| = 6$ cm,

$m(\widehat{FEC}) = m(\widehat{EFC}) \Rightarrow |FC| = |EC| = 3$ cm

$\Rightarrow$ Çevre / The perimeter (ABCD) = 2·(6 + 9) = 30 cm

**Yanıt / Answer C**

**8.**




$(7 - x) + x + (7 - x) = 12$

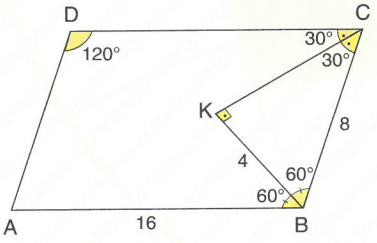
$x = 2$ cm

$\widehat{FKE} \sim \widehat{BKA}$

$\frac{|KE|}{|KA|} = \frac{|FE|}{|AB|} = \frac{2}{12} = \frac{1}{6}$

**Yanıt / Answer B**

**9.**



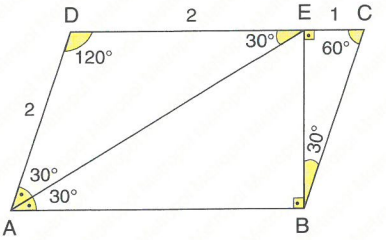

$|KB| = 4$ cm $\Rightarrow |CB| = 8$ cm

$|AB| = 2 \cdot |CB| \Rightarrow |AB| = 16$ cm

$\Rightarrow$ Çevre / The perimeter (ABCD) = 2·(8 + 16) = 48 cm

**Yanıt / Answer A**

**10.**

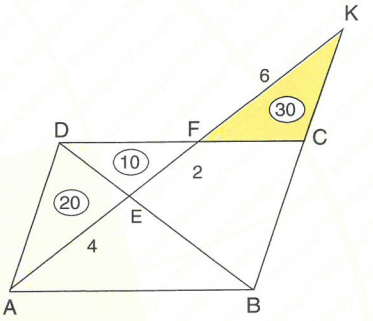



$|BC| = 2$ cm $\Rightarrow |AD| = |DE| = 2$ cm

$\Rightarrow$ Çevre / The perimeter (ABCD) = 2·(2 + 3) = 10 cm

**Yanıt / Answer B**

**11.**




$A(\widehat{DEF}) = 10\ cm^2 \Rightarrow A(\widehat{ADE}) = 20\ cm^2$

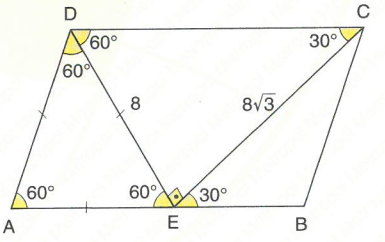
$A(\widehat{ADF}) \sim A(\widehat{KCF})$

$\frac{A(\widehat{DFA})}{A(\widehat{FKC})} = \left(\frac{|AF|}{|FK|}\right)^2$

$\frac{30}{A(\widehat{FKC})} = \left(\frac{6}{6}\right)^2 \Rightarrow A(\widehat{FKC}) = 30\ cm^2$

**Yanıt / Answer E**

**12.**

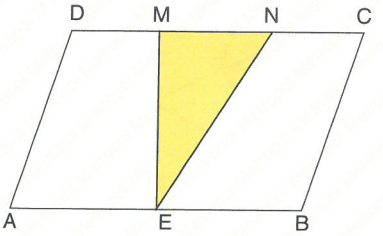



$|DE| = 8$ cm, $|DC| = 16$ cm

$2 \cdot A(\widehat{DEC}) = A(ABCD) = 2 \cdot \frac{8 \cdot 8\sqrt{3}}{2} = 64\sqrt{3}\ cm^2$

**Yanıt / Answer B**

**1.**




ABCD bir paralelkenardır. / ABCD is a parallelogram.

$|DM| = |NC| = \frac{1}{2} \cdot |MN|$, $A(ABCD) = 40\ cm^2$

$\Rightarrow$ **$A(\widehat{MEN}) = ?\ cm^2$**

A) 4 B) 5 C) 6 D) 8 E) 10

**2.** ABCD bir paralelkenardır.

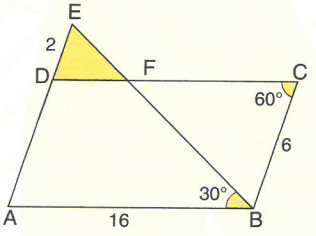
ABCD is a parallelogram.

$m(\widehat{FCB}) = 60°$,

$m(\widehat{EBA}) = 30°$,

$|BC| = 6$ cm,

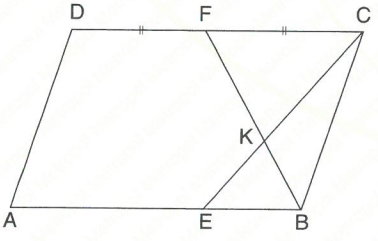
$|AB| = 16$ cm




$\Rightarrow$ **$A(\widehat{DEF}) = ?\ cm^2$**

A) $\sqrt{3}$ B) $2\sqrt{3}$ C) $3\sqrt{3}$ D) $4\sqrt{3}$ E) $5\sqrt{3}$

**3.**



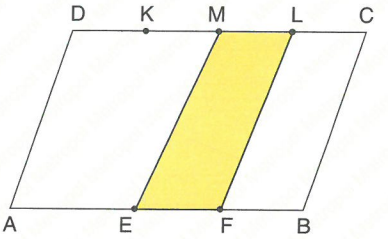

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$|DF| = |FC|$, $|AE| = 3 \cdot |EB|$, $A(\widehat{KEB}) = 5\ cm^2$

$\Rightarrow$ **$A(ABCD) = ?\ cm^2$**

A) 90 B) 100 C) 110 D) 120 E) 150

**4.**



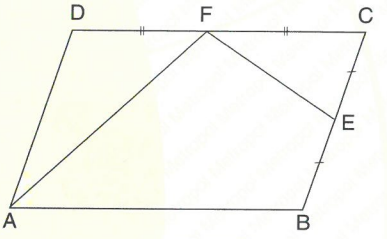

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$|DK| = |KM| = |ML| = |LC|$, $|AE| = |EF| = |FB|$,

$A(ABCD) = 120\ cm^2 \Rightarrow$ **$A(EFLM) = ?\ cm^2$**

A) 35 B) 40 C) 50 D) 60 E) 70

**5.**



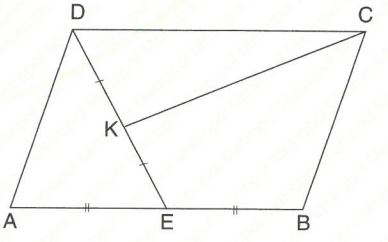

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$|DF| = |FC|$, $|EC| = |EB|$, $A(\widehat{FEC}) = 12\ cm^2$

$\Rightarrow$ **$A(ABCD) = ?\ cm^2$**

A) 80 B) 88 C) 96 D) 104 E) 112

**6.**



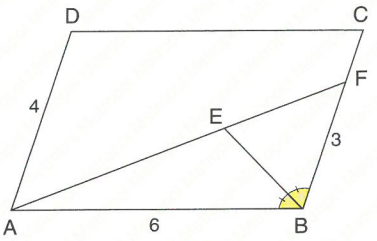

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$|AE| = |EB|$, $|DK| = |KE|$, $A(KEBC) = 36\ cm^2$

$\Rightarrow$ **$A(ABCD) = ?\ cm^2$**

A) 72 B) 80 C) 96 D) 120 E) 144

**7.**



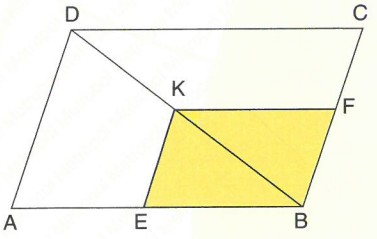

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$m(\widehat{ABE}) = m(\widehat{EBF})$, IABI = 6 cm, IBFI = 3 cm

IADI = 4 cm $\Rightarrow \dfrac{\mathbf{A(\widehat{AEB})}}{\mathbf{A(ABCD)}} = ?$

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$ D) $\frac{1}{5}$ E) $\frac{1}{6}$

**8.**



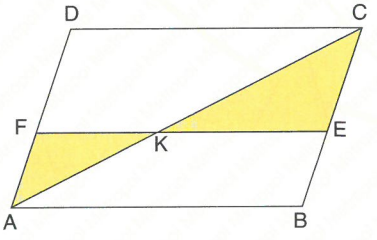

ABCD bir paralelkenardır. / ABCD is a parallelogram.

IAEI = IEBI, IBFI = IFCI,

A(ABCD) = 80 $cm^2$ $\Rightarrow$ **Taralı alan / The shaded area = ? $cm^2$**

A) 10 B) 16 C) 18 D) 20 E) 32

**9.**



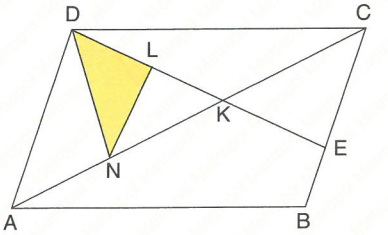

ABCD bir paralelkenardır. / ABCD is a parallelogram.

[FE] // [AB], IKCI = 2·IAKI, A(ABCD) = 180 $cm^2$

$\Rightarrow$ **Taralı alan / The shaded area = ? $cm^2$**

A) 18 B) 27 C) 36 D) 45 E) 50

**10.**



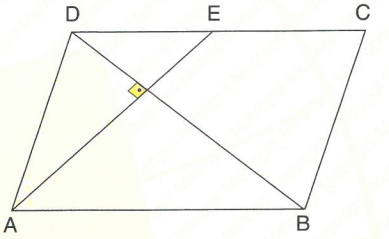

ABCD bir paralelkenardır. / ABCD is a parallelogram.

[LN] // [EC], 3·IBEI = 2·IECI, 3·IANI = INCI,

$A(\widehat{DNL}) = 12\ cm^2 \Rightarrow$ **A(ABCD) = ? $cm^2$**

A) 160 B) 150 C) 140 D) 130 E) 120

**11.**



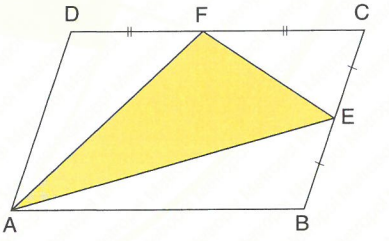

ABCD bir paralelkenardır. / ABCD is a parallelogram.

[BD] ⊥ [AE], IDEI = IECI, IAEI = 9 cm, IBDI = 12 cm

$\Rightarrow$ **A(ABCD) = ? $cm^2$**

A) 78 B) 72 C) 64 D) 52 E) 48

**12.**




ABCD bir paralelkenardır. / ABCD is a parallelogram.

IDFI = IFCI, IEBI = IECI, $A(\widehat{AEF}) = 48\ cm^2$

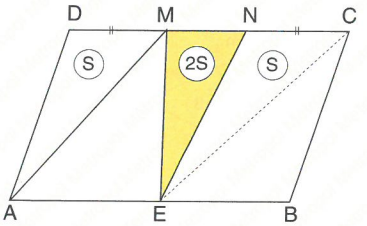
$\Rightarrow$ **A(ABCD) = ? $cm^2$**

A) 128 B) 116 C) 96 D) 72 E) 64

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | B | D | A | C | A | C | D | E | A | B | A |

**1.**




$2\cdot|DMI| = 2\cdot|NCI| = |MNI| \Rightarrow 2\cdot A(\widehat{DAM}) = 2\cdot A(\widehat{NEC}) = A(\widehat{MEN})$

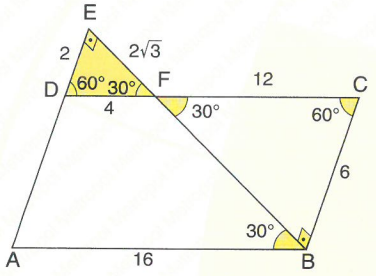
$\Rightarrow A(ABCD) = 8\cdot S$

$40 = 8\cdot S$

$S = 5\ cm^2 \Rightarrow A(\widehat{MEN}) = 2\cdot S = 2\cdot 5 = 10\ cm^2$

**Yanıt / Answer E**

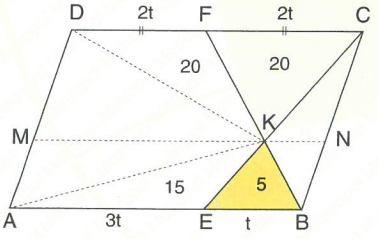
**2.**




$A(\widehat{DEF}) = \dfrac{2.2\sqrt{3}}{2} = 2\sqrt{3}\ cm^2$

**Yanıt / Answer B**

**3.**




$\left.\begin{array}{l}[MN] \,//\, [AB] \\ \widehat{KEB} \sim \widehat{KCF}\end{array}\right\} \Rightarrow$

$A(\widehat{KEB}) = 5\ cm^2 \Rightarrow A(\widehat{FKC}) = 20\ cm^2$

$A(\widehat{FKC}) = 20\ cm^2 \Rightarrow A(\widehat{DKC}) = 40\ cm^2$

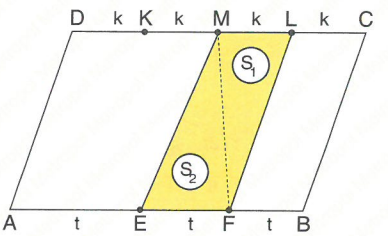
$A(\widehat{KEB}) = 5\ cm^2 \Rightarrow A(\widehat{AKB}) = 20\ cm^2$

$\dfrac{A(ABCD)}{2} = A(\widehat{DKC}) + A(\widehat{AKB})$

$A(ABCD) = 2\cdot(40+20) = 120\ cm^2$

**Yanıt / Answer D**

**4.**



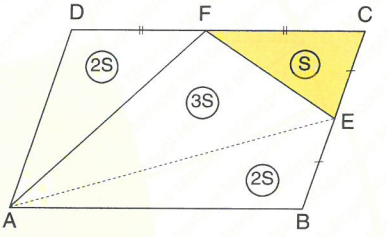

$S_1 = \left(\dfrac{120}{2}\right)\cdot\dfrac{1}{4} = 15\ cm^2$

$S_2 = \left(\dfrac{120}{2}\right)\cdot\dfrac{1}{3} = 20\ cm^2$

$\Rightarrow S_1 + S_2 = 15 + 20 = 35\ cm^2$

**Yanıt / Answer A**

**5.**

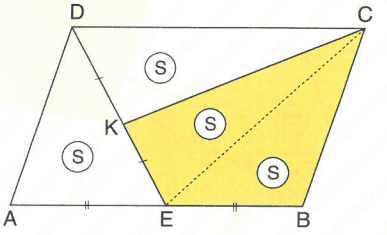



$A(\widehat{EFC}) = S = 12\ cm^2$

$\Rightarrow A(ABCD) = 8\cdot S = 8\cdot 12 = 96\ cm^2$

**Yanıt / Answer C**

**6.**




$A(KEBC) = 2\cdot S = 36\ cm^2$

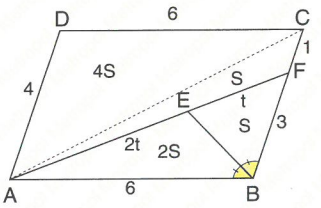
$S = 18\ cm^2$

$A(ABCD) = 4\cdot S$

$= 4\cdot 18 = 72\ cm^2$

**Yanıt / Answer A**

**7.**



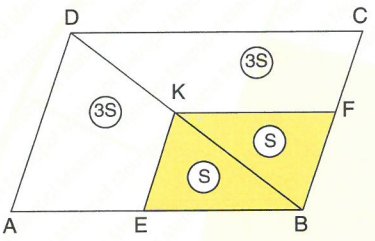

$m(\widehat{ABE}) = m(\widehat{EBF})$

$\left.\begin{array}{l}\dfrac{3}{|EF|} = \dfrac{6}{|EA|}\end{array}\right\} \Rightarrow \begin{array}{l} 2\cdot|EF| = |AE| \\ |EF| = t \Rightarrow |AE| = 2t\end{array}$

$A(\widehat{EBF}) = S \Rightarrow \left.\begin{array}{l} A(\widehat{AEB}) = 2S \\ A(ABCD) = 8S\end{array}\right\} \Rightarrow \dfrac{2S}{8S} = \dfrac{1}{4}$

**Yanıt / Answer C**

**8.**

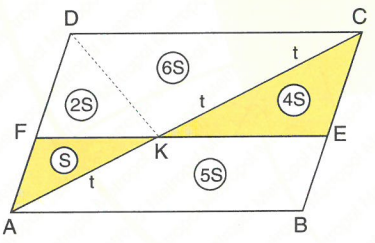



$8\cdot S = 80 \Rightarrow S = 10\ cm^2$

$\Rightarrow$ taralı alan / The shaded area $= 2\cdot S = 20\ cm^2$

**Yanıt / Answer D**

**9.**




$A(ABCD) = 18\cdot S$

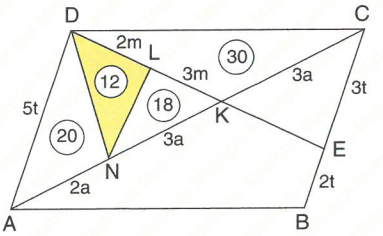
$180 = 18\cdot S$

$S = 10\ cm^2$

Taralı alan / The shaded area $= 5\cdot S = 5\cdot 10 = 50\ cm^2$

**Yanıt / Answer E**

**10.**



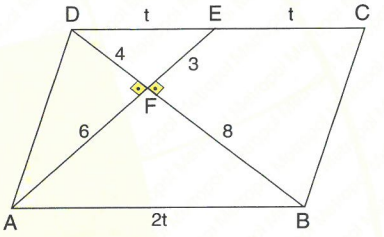

$A(ABCD) = 2\cdot A(\widehat{DAC})$

$A(ABCD) = 2\cdot(20 + 12 + 18 + 30)$

$= 160\ cm^2$

**Yanıt / Answer A**

**11.**




$\widehat{DEF} \sim \widehat{AFB}$

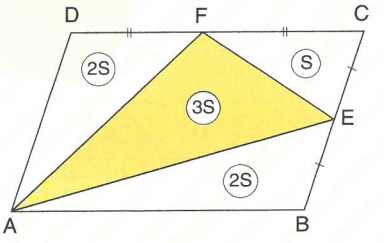
$\dfrac{|EF|}{|AF|} = \dfrac{|DE|}{|AB|} = \dfrac{t}{2t}$

$\Rightarrow |OE| = 3\ cm,\ |OA| = 6\ cm$

$A(ABCD) = 6\cdot 12 = 72\ cm^2$

**Yanıt / Answer B**

**12.**

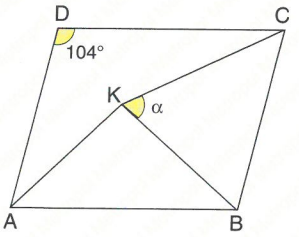



$3S = 48\ cm^2 \Rightarrow S = 16\ cm^2$

$A(ABCD) = 8\cdot S = 8\cdot 16 = 128\ cm^2$

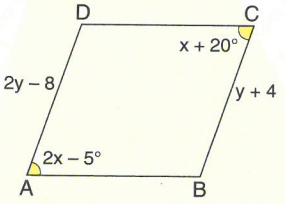
**Yanıt / Answer A**

**1.** ABCD bir eşkenar dörtgen, AKB bir eşkenar üçgendir.
ABCD is an equilateral quadrangle, AKB is an equilateral triangle.
$m(\widehat{ADC}) = 104°$
$\Rightarrow$ **$m(\widehat{CKB}) = \alpha = ?$**



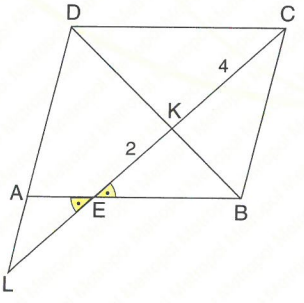

A) 60° B) 65° C) 68° D) 71° E) 74°

**2.** ABCD eşkenar dörtgendir.
ABCD is an equilateral quadrangle.
$|BC| = y + 4$ cm,
$|AD| = 2y - 8$ cm,
$m(\widehat{A}) = 2x - 5°$,
$m(\widehat{C}) = x + 20°$ $\Rightarrow$ **$A(ABCD) = ?\ cm^2$**



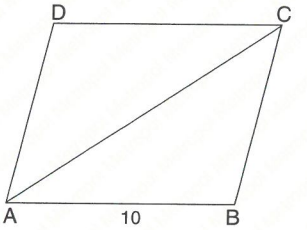

A) $16\sqrt{2}$ B) $72\sqrt{2}$ C) $56\sqrt{2}$ D) $108\sqrt{2}$ E) $128\sqrt{2}$

**3.** ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadrangle.
$|KC| = 4$ cm,
$|KE| = 2$ cm
$\Rightarrow$ **$|EL| = ?$ cm**



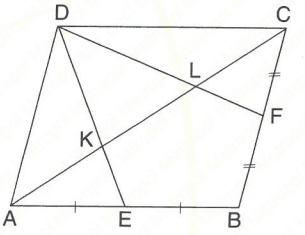

A) 3 B) 4 C) 5 D) 6 E) 7

**4.** ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadrangle.
$m(\widehat{DAB}) = 60°$,
$|AB| = 10$ cm
$\Rightarrow$ **$|AC| = ?$ cm**



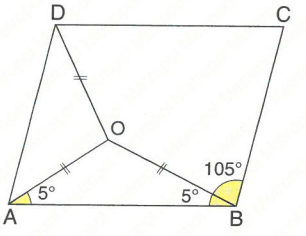

A) $5\sqrt{3}$ B) 10 C) $10\sqrt{3}$ D) 20 E) $20\sqrt{3}$

**5.** ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadrangle.
$|AC| = 36$ cm,
$|AE| = |EB|$,
$|BF| = |FC|$
$\Rightarrow$ **$|KL| = ?$ cm**



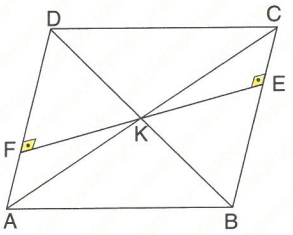

A) 8 B) 9 C) 10 D) 12 E) 14

**6.** ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadrangle.
$|DO| = |AO| = |OB|$,
$m(\widehat{OBC}) = 105°$
$m(\widehat{OAB}) = m(\widehat{OBA}) = 5°$
$\Rightarrow$ **$m(\widehat{ADO}) = ?$**




A) 40° B) 45° C) 50° D) 60° E) 65°

**7.**




ABCD bir eşkenar dörtgendir.

ABCD is an equilateral quadrangle.

[EF] ⊥ [AD], [FE] ⊥ [BC], IAFI = 1 cm, IBEI = 3 cm

⇒ **Çevre / The perimeter (ABCD) = ? cm**

A) $16\sqrt{3}$ B) 16 C) $8\sqrt{3}$ D) $6\sqrt{3}$ E) $4\sqrt{3}$

**8.** ABCD bir eşkenar dörtgendir.

ABCD is an equilateral quadrangle.

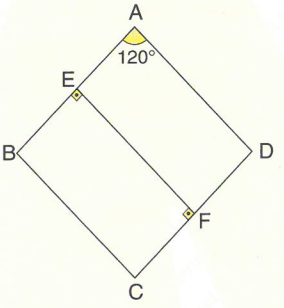
[EF] ⊥ [CD],

[EF] ⊥ [AB],

IABI = 3 cm,

$m(\widehat{A}) = 120°$

⇒ **IEFI = ? cm**




A) $\frac{2\sqrt{3}}{3}$ B) $\sqrt{7}$ C) $\sqrt{10}$ D) $\frac{3\sqrt{3}}{2}$ E) $\sqrt{13}$

**9.** ABCD bir eşkenar dörtgendir.

ABCD is an equilateral quadrangle.

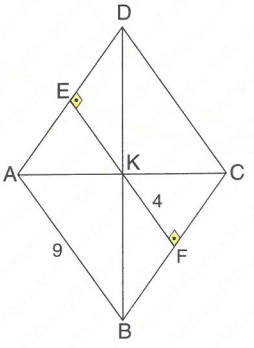
[FE] ⊥ [AD],

[EF] ⊥ [BC],

IKFI = 4 cm,

IABI = 9 cm

⇒ **$IBFI^2 + ICFI^2$ = ? cm**




A) 25 B) 36 C) 49 D) 52 E) 64

**10.** ABCD eşkenar dörtgendir.

INKI, IKFI ∈ Z

ABCD is an equilateral quadral.

IANI = INDI,

IDKI = IKCI,

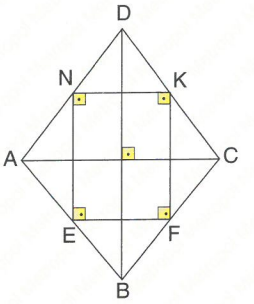
ICFI = IBFI,

IAEI = IEBI

Çevre / The perimeter (NEFK) = 6 cm,

A(ABCD) = 4 $cm^2$

⇒ **Çevre / The perimeter (ABCD) = ? cm**




A) $4\sqrt{5}$ B) $8\sqrt{3}$ C) $12\sqrt{2}$ D) $8\sqrt{5}$ E) $16\sqrt{3}$

**11.** ABCD bir eşkenar dörtgendir.

ABCD is an equilateral quadrangle.

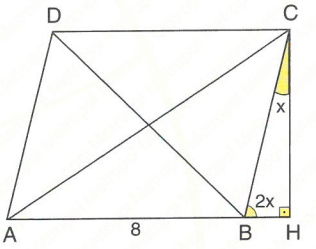
[AH] ⊥ [CH],

IABI = 8 cm,

$m(\widehat{CBH}) = 2x$,

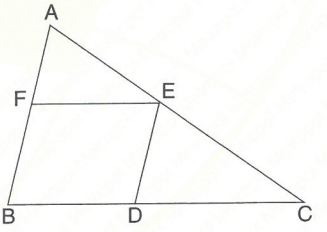
$m(\widehat{BCH}) = x$

⇒ **IACI ·IBDI = ? $cm^2$**




A) 32 B) $32\sqrt{3}$ C) $64\sqrt{3}$ D) $93\sqrt{3}$ E) $128\sqrt{3}$

**12.**




ABC bir üçgen, BDEF bir eşkenar dörtgendir.

ABC is a triangle, BDEF is an equilateral quadrangle.

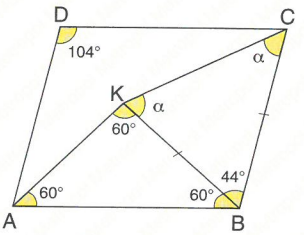
$\frac{IAEI}{IECI} = \frac{2}{5} \Rightarrow \frac{IAFI}{IDCI} = ?$

A) $\frac{4}{25}$ B) $\frac{12}{25}$ C) $\frac{14}{25}$ D) $\frac{16}{25}$ E) $\frac{18}{25}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | E | D | C | D | E | B | D | C | A | C | A |

**1.**



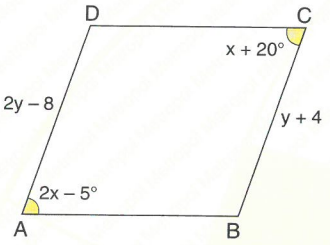

$m(\widehat{D}) = m(\widehat{B}) = 104°$

$m(\widehat{KBD}) = 104° - 60° = 44°$

$2\alpha = 180° - 44° = 136° \Rightarrow \alpha = 68°$

**Yanıt / Answer C**

**2.**




$2y - 8 = y + 4$

$y = 12$

$|AD| = 2y - 8$

$|AD| = 16$ cm

$2x - 5° = x + 20°$

$x = 25°$

$m(\widehat{A}) = 2x - 5°$

$m(\widehat{A}) = 45°$

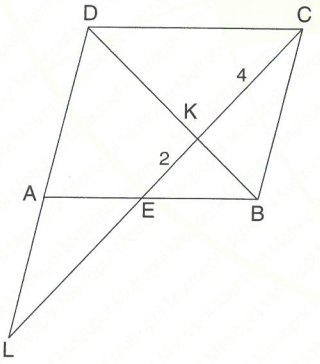
$A(ABCD) = a^2 \cdot \sin\widehat{A}$

$= 16^2 \cdot \sin 45°$

$= 16^2 \cdot \frac{\sqrt{2}}{2} = 128\sqrt{2}$ cm$^2$

**Yanıt / Answer E**

**3.**

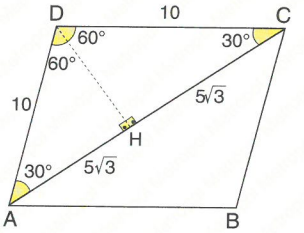



$|CK|^2 = |KE| \cdot |KL|$

$16 = 2 \cdot |KL| \Rightarrow |KL| = 8$ cm $\Rightarrow |LE| = 6$ cm

**Yanıt / Answer D**

**4.**



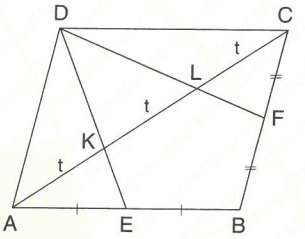

[DH] ve [AC] çizilirse, aşağıdaki sonuç bulunur.

By drawing [DH] ⊥ [AC], we obtain following result.

$|AH| = |HC| = 5\sqrt{3} \Rightarrow |AC| = 10\sqrt{3}$ cm

**Yanıt / Answer C**

**5.**

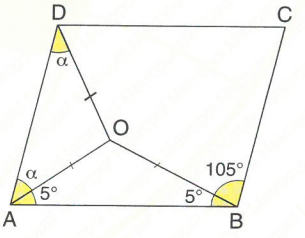



$\left.\begin{array}{l}|AE| = |EB| \\ |CF| = |FB|\end{array}\right\} \Rightarrow |AK| = |KL| = |LC|$

$3t = 36 \Rightarrow t = 12 \Rightarrow |KL| = 12$ cm

**Yanıt / Answer D**

**6.**




$|AO| = |OB| \Rightarrow m(\widehat{OBA}) = m(\widehat{OAB}) = 5°$

$m(\widehat{DAB}) = 180° - m(\widehat{ABC})$

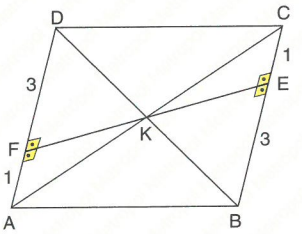
$\Rightarrow m(\widehat{DAB}) = 180° - 110° = 70°$

$m(\widehat{ADO}) = m(\widehat{DAO}) = \alpha$

$\alpha + 5 = 70° \Rightarrow \alpha = 65°$

**Yanıt / Answer E**

**7.**

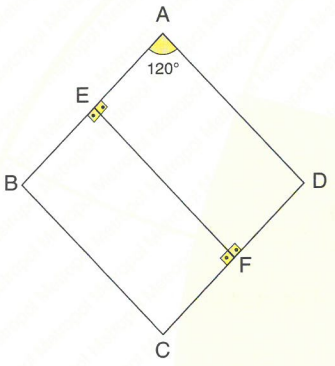



$$\left.\begin{array}{l} |DF| = |EB| = 3 \text{ cm} \\ |FA| = |CE| = 1 \text{ cm} \end{array}\right\} \Rightarrow |CB| = 1 + 3 = 4 \text{ cm}$$

Çevre / The Perimeter (ABCD) = 4·4 = 16 cm

**Yanıt / Answer B**

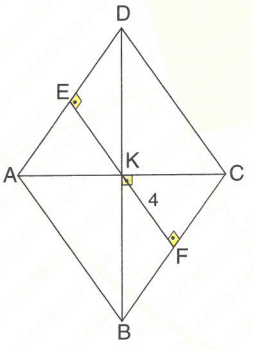
**8.**




$$A(ABCD) = 3\cdot3\cdot\sin120° = |EF|\cdot3 \Rightarrow |EF| = 3\cdot\frac{\sqrt{3}}{2} \text{ cm}$$

**Yanıt / Answer D**

**9.**




$4^2 = |BF|\cdot|FC|$ [ Euclid ]

$16 = |BF|\cdot|FC|$

$|BF| + |FC| = 9$ cm

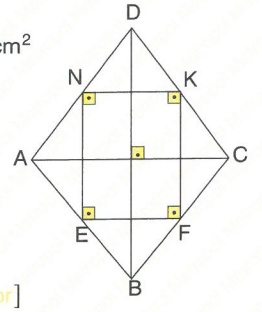
$(|BF| + |FC|)^2 = (9)^2$ cm$^2$

$\Rightarrow |BF|^2 + |FC|^2 + 2\cdot|BF|\cdot|FC| = 81$ cm$^2$

$|BF|^2 + |FC|^2 = 49$ cm$^2$

**Yanıt / Answer C**

**10.**




$|KF| + |NK| = 3$ cm

$$A(ABCD) = \frac{|AC|\cdot|BD|}{2} = 4 \text{ cm}^2$$

$|AC|\cdot|BD| = 8$ cm

$2\cdot|KN|\cdot2\cdot|KF| = 8$cm

$|NK|\cdot|KF| = 2$ cm

$$\begin{cases} |NK| = 1 \text{ cm} \\ |KF| = 2 \text{ cm} \end{cases} \Rightarrow \begin{cases} |AC| = 2 \text{ cm} \\ |BD| = 4 \text{ cm} \end{cases}$$

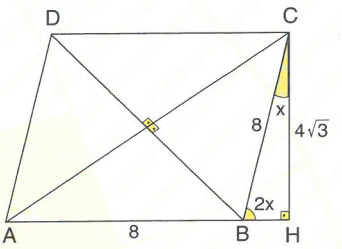
$$\Rightarrow a^2 = \left(\frac{2}{2}\right)^2 + \left(\frac{4}{2}\right)^2 = 5 \quad \text{[Pythagor]}$$

$a = \sqrt{5}$ cm

Çevre / The perimeter (ABCD) = $4\sqrt{5}$ cm

**Yanıt / Answer A**

**11.**




$x + 2x = 90^o \Rightarrow x = 30^o$

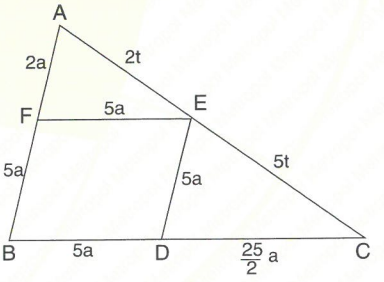
$|CB| = 8$ cm $\Rightarrow |CH| = 4\sqrt{3}$ cm

$$A(ABCD) = \frac{4\sqrt{3}\cdot8}{1} = 32\sqrt{3} \text{ cm}$$

$$A(ABCD) = \frac{|AC|\cdot|BD|}{2} \Rightarrow |AC|\cdot|BD| = 64\sqrt{3} \text{ cm}^2$$

**Yanıt / Answer C**

**12.**

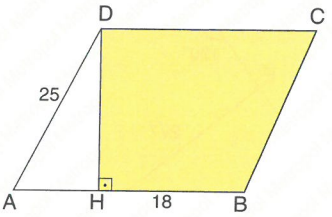



$$A(\widehat{AFE}) \sim A(\widehat{EDC})$$

$$\Rightarrow \frac{|AF|}{|DC|} = \frac{2a}{\frac{25a}{2}} = \frac{4}{25}$$

**Yanıt / Answer A**

**1.**




ABCD bir eşkenar dörtgendir.

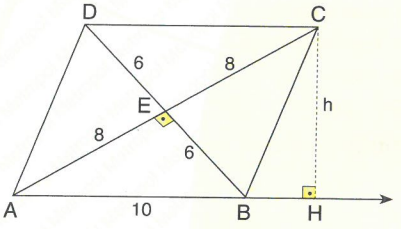
ABCD is an equilateral quadrangle.

[DH] ⊥ [AB], |AD| = 25 cm, |HB| = 18 cm

⇒ **A(DHBC) = ? cm²**

A) 496 B) 500 C) 508 D) 516 E) 520

**2.**




ABCD bir eşkenar dörtgendir.

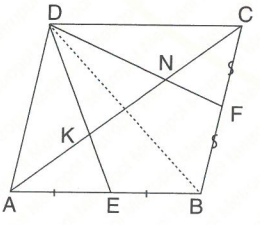
ABCD is an equilateral quadrangle.

[AC] ⊥ [BD], [DH] ⊥ [AH], |AE| = 8 cm,

|DE| = 6 cm ⇒ **|CH| = h = ? cm**

A) 12 B) 10 C) 9,6 D) 9,2 E) 8,8

**3.**




ABCD bir eşkenar dörtgendir.

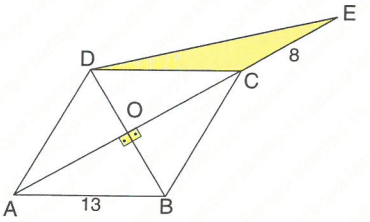
ABCD is an equilateral quadrangle.

|CF| = |FB|, |AE| = |EB|, |AC| = 36 cm

⇒ **|KN| = ? cm**

A) 8 B) 9 C) 10 D) 12 E) 13

**4.**




ABCD bir eşkenar dörtgendir.

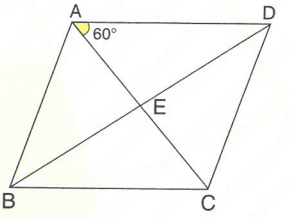
ABCD is an equilateral quadrangle.

|AC| = 24 cm, |CE| = 8 cm, |AB| = 13 cm

⇒ **A($\widehat{DCE}$) = ? cm²**

A) 5 B) 10 C) 15 D) 20 E) 25

**5.**




ABCD bir eşkenar dörtgendir.

ABCD is an equilateral quadrangle.

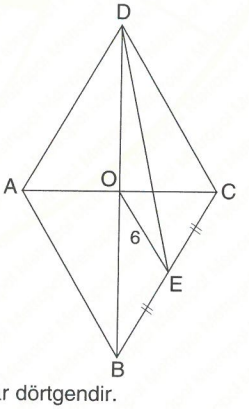
[AC] ∩ [BD] = {E}, m($\widehat{CAD}$) = 60°,

|BD|·|AC| = $144\sqrt{3}$ cm²

⇒ **Çevre / The perimeter (ABCD) = ? cm**

A) 40 B) 42 C) 44 D) 46 E) 48

**6.**




ABCD bir eşkenar dörtgendir.

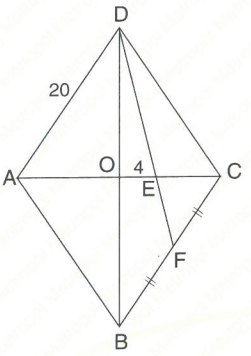
ABCD is an equilateral quadrangle.

[AC] ∩ [BD] = {O}, |BE| = |EC|, |OE| = 6 cm

**Çevre / The perimeter (ABCD) = ? cm**

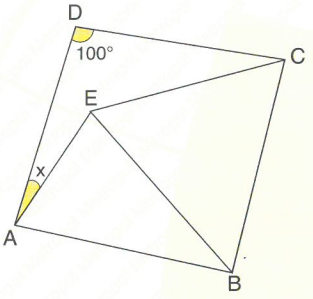
A) 18 B) 24 C) 36 D) 48 E) 60

**7.** ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadrangle.
[AC] ∩ [BD] = {O},
[DF] ∩ [AC] = {E},
IBFI = IFCI,
IOEI = 4 cm,
IADI = 20 cm
⇒ **A(ABCD) = ? cm²**




A) 384 B) 372 C) 308 D) 296 E) 288

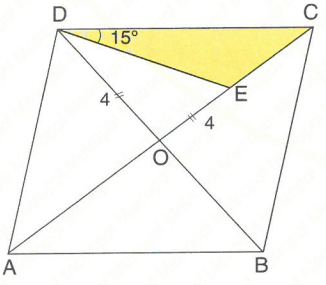
**8.**




ABCD bir eşkenar dörtgen, BEC bir eşkenar üçgendir.
ABCD is an equilateral quadrangle, BEC is an equilateral triangle.
m($\widehat{ADC}$) = 100° ⇒ **m($\widehat{DAE}$) = x = ?**

A) 5° B) 10° C) 15° D) 18° E) 20°

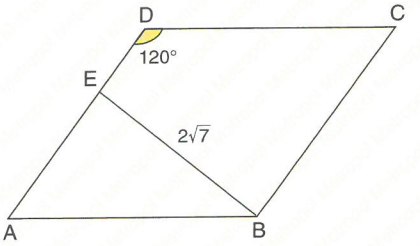
**9.**




ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadral.
IODI = IOEI = 4 cm, m($\widehat{CDE}$) = 15° ⇒ A($\widehat{CED}$) = **? cm²**

A) $8\sqrt{3} - 16$ B) $6\sqrt{3}$ C) $2\sqrt{6}$
D) $8\sqrt{3} - 8$ E) $4\sqrt{3} - 4$

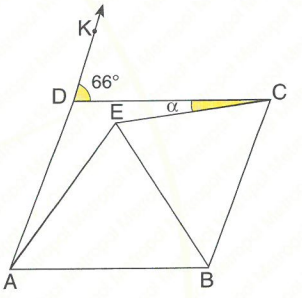
**10.**




ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadrangle.
m($\widehat{ADC}$) = 120°, IAEI = 2·IEDI, IBEI = $2\sqrt{7}$ cm
⇒ **A(ABCD) = ? cm²**

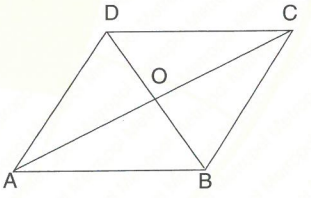
A) $20\sqrt{3}$ B) $15\sqrt{3}$ C) $16\sqrt{3}$
D) $8\sqrt{15}$ E) $18\sqrt{3}$

**11.** ABCD bir eşkenar dörtgen, ABE bir eşkenar üçgendir.
ABCD is an equilateral quadrangle, ABE is an equilateral triangle.
m($\widehat{KDC}$) = 66°
⇒ **m($\widehat{DCE}$) = α = ?**




A) 7° B) 6° C) 5° D) 3° E) 2°

**12.**



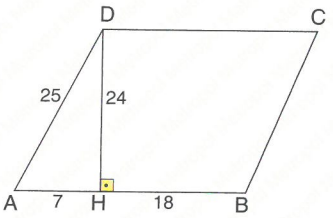

ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadrangle.
IOCI·IODI = 24 cm, IACI + IBDI = 20 cm
**Çevre / The perimeter (ABCD) = ? cm.**

A) $2\sqrt{130}$ B) $4\sqrt{35}$ C) $10\sqrt{6}$
D) $12\sqrt{5}$ E) $8\sqrt{13}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | C | D | D | E | D | A | B | D | E | D | E |

**1.**




$|DH| = \sqrt{25^2 - 7^2} = 24$ cm

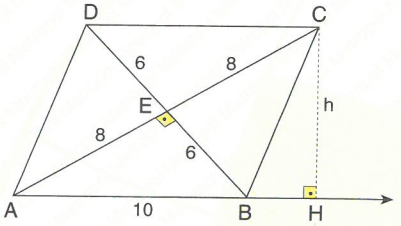
$A(ABCD) = 24 \cdot 25 = 600$ cm$^2$,

$A(\widehat{ADH}) = \dfrac{24 \cdot 7}{2} = 84$ cm$^2$

$A(DHBC) = 600 - 84 = 516$ cm$^2$

**Yanıt / Answer D**

**2.**




$|AB| = \sqrt{8^2 + 6^2} = 10$ cm [Pythagor]

$|AB| = 10$ cm,

$A(ABCD) = \dfrac{16 \cdot 12}{2} = 96$ cm$^2$

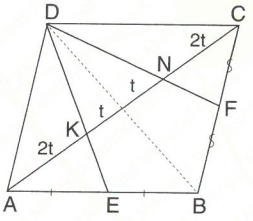
$A(ABCD) = h \cdot 10$

$96 = 10 \cdot h$

$h = 9{,}6$ cm

**Yanıt / Answer C**

**3.**




$\left.\begin{array}{l} |AE| = |EB| \\ |CF| = |HB| \end{array}\right\} \Rightarrow |AK| = |KN| = |NC|$

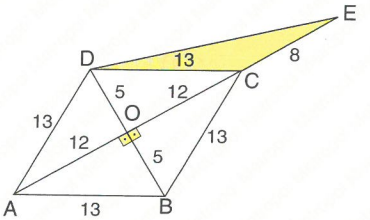
$|AC| = 36 \Rightarrow 6t = 36$

$t = 6$ cm

$|KN| = 2 \cdot t \Rightarrow |KN| = 2 \cdot 6 = 12$ cm

**Yanıt / Answer D**

**4.**

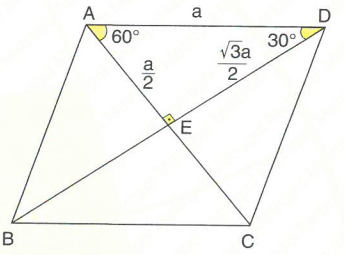



$|DO| = \sqrt{13^2 + 12^2} = 5$ cm [Pythagor]

$A(\widehat{DCE}) = \dfrac{5 \cdot 8}{2} = 20$ cm$^2$

**Yanıt / Answer D**

**5.**




$\perp \widehat{AED}$ (30°, 60°, 90°)

$\Rightarrow |AD| = a \Rightarrow |AE| = \dfrac{a}{2} \wedge |DE| = \dfrac{\sqrt{3} \cdot a}{2}$

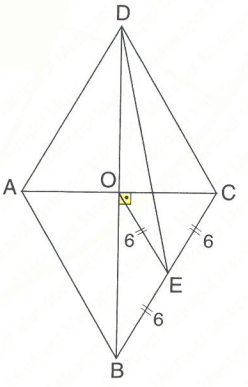
$|BH| \cdot |AC| = 144\sqrt{3}$ cm$^2$

$(\sqrt{3} \cdot a) \cdot (a) = 144\sqrt{3} \Rightarrow a = 12$ cm.

Çevre / The perimeter (ABCD) $= 4 \cdot a = 4 \cdot 12 = 48$ cm

**Yanıt / Answer E**

**6.**



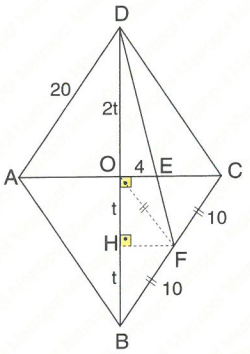

$\left.\begin{array}{l} m(\widehat{OCA}) = 90° \\ |CE| = |EB| \end{array}\right\} \Rightarrow |OE| = |BE| = |EC|$

$|OE| = 6$ cm $\Rightarrow |CE| = |EB| = 6$ cm.

Çevre / The perimeter (ABCD) $= 4 \cdot 12 = 48$ cm

**Yanıt / Answer D**

**7.**




$|OF| = 10$ cm

$\frac{|DO|}{|DH|} = \frac{|OE|}{|HF|} \Rightarrow \frac{2t}{3t} = \frac{4}{|FH|}$

$\Rightarrow |FH| = 6$ cm

$\Rightarrow t = 8$ cm

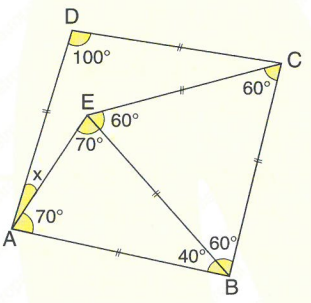
$\frac{|BH|}{|FH|} = \frac{|BO|}{|OC|} \Rightarrow \frac{8}{6} = \frac{16}{|OC|} \Rightarrow |OC| = 12$ cm

$A(ABCD) = \frac{|AC| \cdot |BD|}{2} = \frac{24 \cdot 32}{2} = 384 \text{ cm}^2$

**Yanıt / Answer A**

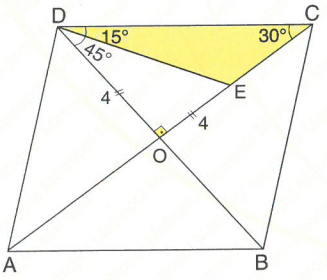
**8.** $x + 70° = 80°$

$\Rightarrow x = 10°$




**Yanıt / Answer B**

**9.**




$\perp \widehat{DOC}$ (30°, 60°, 90°)

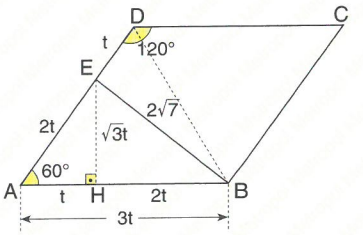
$|DO| = 4$ cm $\Rightarrow |OC| = 4\sqrt{3}$ cm

$|OC| = 4\sqrt{3}$ cm $\Rightarrow |EC| = (4\sqrt{3} - 4)$ cm

$A(\widehat{DEC}) = 4 \cdot \frac{(4\sqrt{3} - 4)}{2} = (8\sqrt{3} - 8) \text{ cm}^2$

**Yanıt / Answer D**

**10.**




$(\sqrt{3}t)^2 + (2t)^2 = (2\sqrt{7})^2$ [ Pythagor ]

$3t^2 + 4t^2 = 4 \cdot 7$

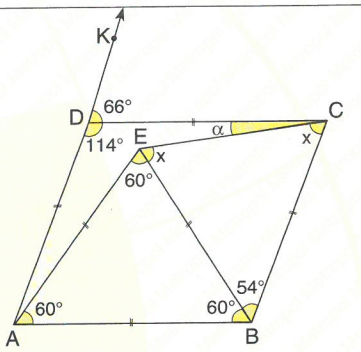
$t^2 = 4 \Rightarrow t = 2$ cm

$A(AEB) = \frac{2\sqrt{3} \cdot 6}{2} = 6\sqrt{3} \text{ cm}^2$

$A(ABCD) = 18\sqrt{3} \text{ cm}^2$

**Yanıt / Answer E**

**11.**



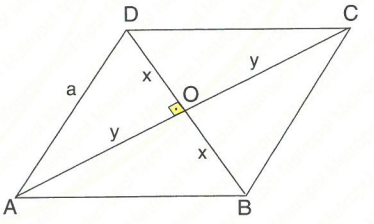

$\alpha + x = 66°$

$2x = 180° - 54°$

$x = 63° \Rightarrow \alpha = 3°$

**Yanıt / Answer D**

**12.**




$x \cdot y = 24$ cm

$2(x + y) = 20 \Rightarrow x + y = 10$ cm

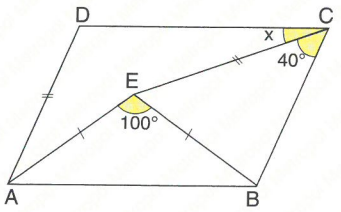
$x^2 + y^2 + 2xy = 100 \Rightarrow x^2 + y^2 = 52$ cm

$a^2 = x^2 + y^2 = 52 \Rightarrow a = 2\sqrt{13}$ cm

Çevre / The perimeter (ABCD) = $4 \cdot 2\sqrt{13} = 8\sqrt{13}$

**Yanıt / Answer E**

**1.**



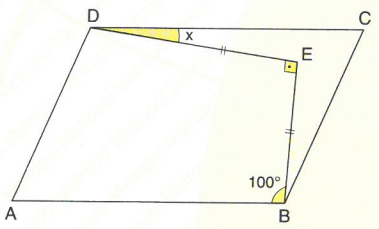

ABCD bir paralelkenardır. / ABCD is a parallelogram.

|ADI = |ECI, |AEI = |EBI, m($\widehat{AEB}$) = 100°

m($\widehat{ECB}$) = 40° ⇒ **m($\widehat{DCE}$) = x = ?**

A) 10° B) 20° C) 30° D) 40° E) 50°

**2.**




ABCD bir paralelkenardır. / ABCD is a parallelogram.

[ED] ⊥ [BE], m($\widehat{EBA}$) = 100°

|DEI = |EBI ⇒ **m($\widehat{CDE}$) = x = ?**

A) 5° B) 10° C) 15° D) 20° E) 25°

**3.** ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadrangle.

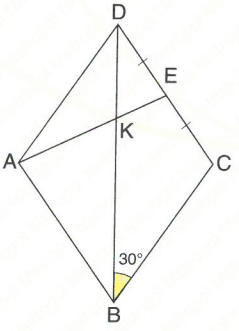
|DEI = |ECI,

m($\widehat{DBC}$) = 30°,

[BD] ∩ [AE] = {K},

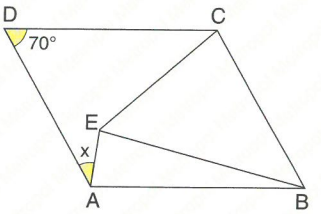
|AEI = 6 cm

⇒ **A(ABCD) = ? cm²**




A) $54\sqrt{3}$ B) $48\sqrt{3}$ C) 72 D) 108 E) $24\sqrt{3}$

**4.**

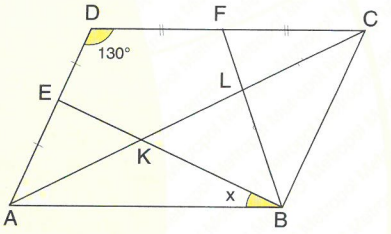



ABCD bir eşkenar dörtgen, EBC bir eşkenar üçgendir.
ABCD is an equilateral quadrangle, EBC is an equilateral triangle.

m($\widehat{ADC}$) = 70° ⇒ **m($\widehat{DAE}$) = x = ?**

A) 15° B) 20° C) 25° D) 30° E) 35°

**5.**




ABCD bir paralelkenardır. / ABCD is a parallelogram.

|AEI = |EDI, |DFI = |FCI, |LCI = |LBI

m($\widehat{ADC}$) = 130° ⇒ **m($\widehat{EBA}$) = x = ?**

A) 30° B) 40° C) 50° D) 60° E) 70°

**6.** ABCD ve DEFK paralelkenardır.
ABCD and DEFK are parallelogram.

m($\widehat{KDC}$) = α,

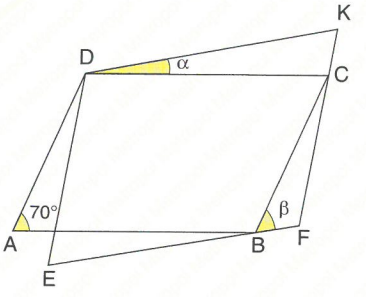
m($\widehat{DAB}$) = 70°,

m($\widehat{CBF}$) = β,

|DAI = |DEI,

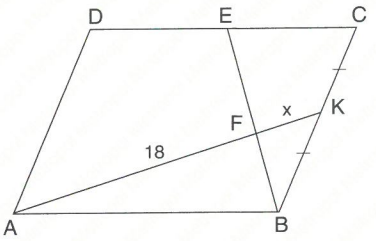
|DKI = |DCI

⇒ **α + β = ?**




A) 40° B) 50° C) 60° D) 70° E) 80°

**7.**




ABCD bir paralelkenardır. / ABCD is a parallelogram

ICKI = IKBI, 2·IECI = IDEI, IAFI = 18 cm ⇒ **IFKI = x = ? cm**

A) 1 B) 2 C) 3 D) 4 E) 5

**8.** **ABCD bir eşkenar dörtgendir.**

ABCD is an equilateral quadrangle.

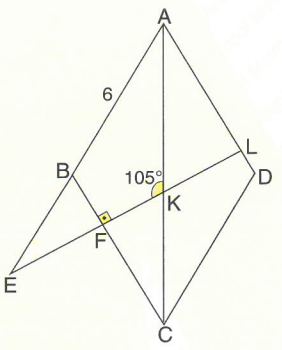
[EL] ⊥ [BC],

[AC] ∩ [EL] = {K},

m($\widehat{AKE}$) =105°,

IABI = 6 cm

⇒ **A(ABCD) = ? cm²**




A) 42 B) $18\sqrt{3}$ C) 18 D) $24\sqrt{3}$ E) 36

**9.** ABCD bir eşkenar dörtgendir.

ABCD is an equilateral quadrangle.

P ∈ [BD],

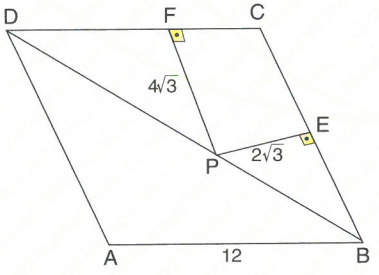
[PE] ⊥ [BC],

[PF] ⊥ [DC],

IPFI = $4\sqrt{3}$ cm,

IPEI = $2\sqrt{3}$ cm,

IABI = 12 cm ⇒ **A(ABCD) = ? cm²**




A) $36\sqrt{3}$ B) $54\sqrt{3}$ C) 108 D) $72\sqrt{3}$ E) 144

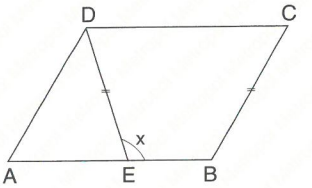
**10.** ABCD bir paralelkenardır.

ABCD is a parallelogram.

3·m($\widehat{ADE}$) = 2·m($\widehat{EDC}$),

IDEI =I BCI

⇒ **m($\widehat{DEB}$) = x = ?**




A) 22,5° B) 35,5° C) 67,5° D) 92,5° E) 112,5°

**11.** ABCD bir paralelkenardır.

ABCD is a parallelogram.

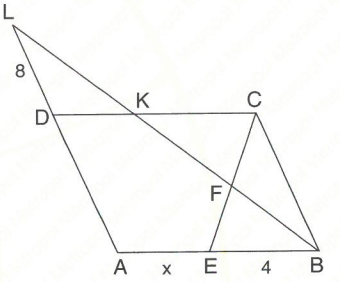
ICFI = 3·IFEI,

ILAI = IABI,

ILDI = 8 cm,

IEBI = 4 cm

⇒ **IAEI = x = ? cm**




A) 4 B) 6 C) 8 D) 12 E) 16

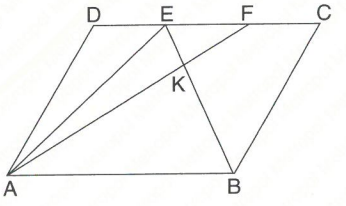
**12.** ABCD bir paralelkenardır.

ABCD is a parallelogram.

A($\widehat{EFK}$) = 3 cm²,

A($\widehat{AKB}$) = 12 cm²

⇒ **A(ABCD) = ? cm²**




A) 36 B) 40 C) 44 D) 48 E) 50

**YANITLAR / ANSWERS**

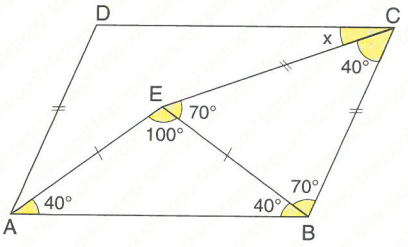
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | B | E | C | B | D | C | C | D | E | E | A |





Ya

**1.**

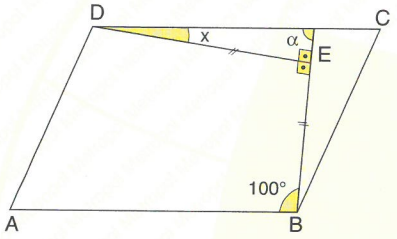



$x + 40° + 70° + 40° = 180°$

$\Rightarrow x = 30°$

**Yanıt / Answer C**

**2.**

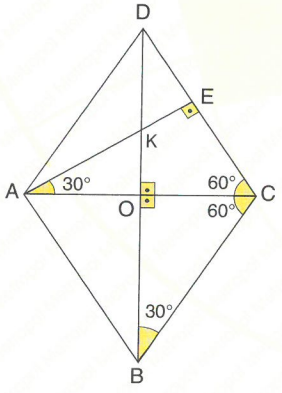



$\alpha = 180° - 100° \Rightarrow \alpha = 80°$

$\Rightarrow x = 10°$

**Yanıt / Answer B**

**3.**




$\perp \widehat{EAC}$ (30°, 60°, 90°),

$|AE| = 6$ cm

$\Rightarrow |EC| = |DE| = 2\sqrt{3}$ cm

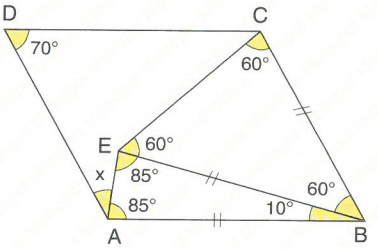
$A(ABCD) = |AE| \cdot |DC|$

$= 6 \cdot 4\sqrt{3}$

$= 24\sqrt{3}$ cm$^2$

**Yanıt / Answer E**

**4.**




$m(\widehat{A}) = 180° - m(\widehat{D})$

$= 180° - 70°$

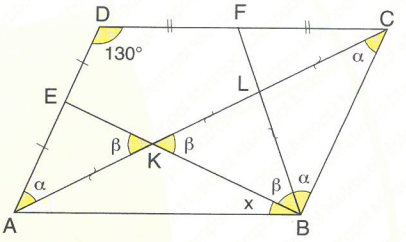
$= 110°$

$x + 85° = 110°$

$x = 25°$

**Yanıt / Answer C**

**5.**

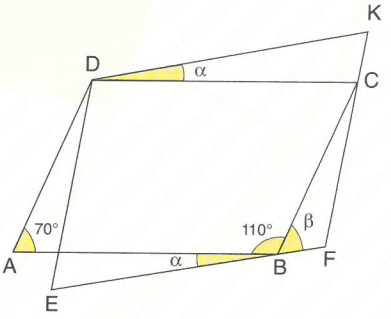



$2\alpha + 2\beta = 180° \Rightarrow \alpha + \beta = 90°$

$x + \alpha + \beta = 130° \Rightarrow x = 40°$

**Yanıt / Answer B**

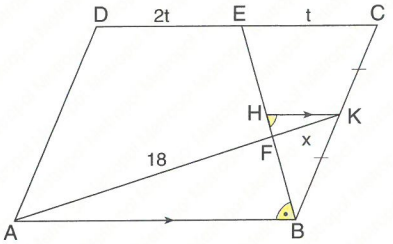
**6.**




$\alpha + 110° + \beta = 180° \Rightarrow \alpha + \beta = 70°$

**Yanıt / Answer D**

**7.**




$[KH] \parallel [AB] \Rightarrow |KH| = \frac{t}{2}$

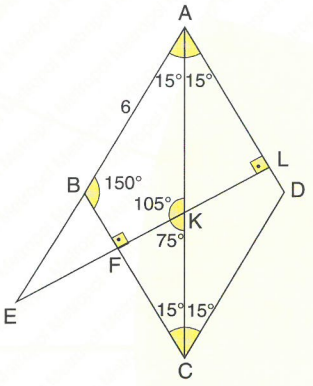
$\widehat{KHF} \sim \widehat{AFB}$

$\frac{|HK|}{|AB|} = \frac{x}{18} \Rightarrow \frac{\frac{t}{2}}{3t} = \frac{x}{18}$

$\Rightarrow 6x = 18 \Rightarrow x = 3$ cm

**Yanıt / Answer C**

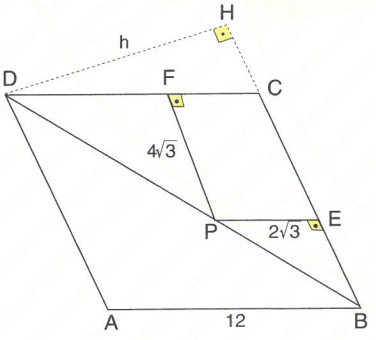
**8.**




$A(ABCD) = 6 \cdot 6 \cdot \sin 150° = 18\ cm^2$

**Yanıt / Answer C**

**9.**

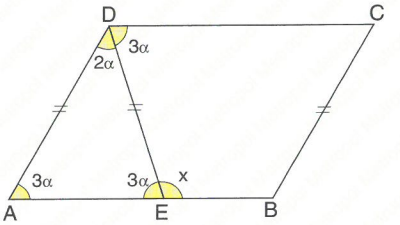



$h = 4\sqrt{3} + 2\sqrt{3} \Rightarrow h = 6\sqrt{3}$ cm

$A(ABCD) = h \cdot |BC| = 6\sqrt{3} \cdot 12 = 72\sqrt{3}\ cm^2$

**Yanıt / Answer D**

**10.**




$|DE| = |BC| = |AD|$

$[DC] \parallel [AB] \Rightarrow m(\widehat{EDC}) = m(\widehat{DEA}) = 3\alpha$

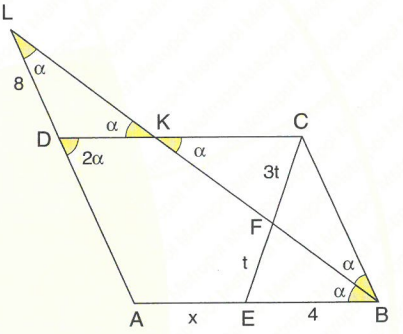
$2\alpha + 3\alpha + 3\alpha = 180°$

$8\alpha = 180° \Rightarrow \alpha = 22{,}5°$

$x + 3\alpha = 180° \Rightarrow x = 180° - 3 \cdot (22{,}5°) = 112{,}5°$

**Yanıt / Answer E**

**11.**




$\widehat{KCF} \sim \widehat{FEB} \Rightarrow$

$\frac{|CK|}{|EB|} = \frac{|CF|}{|FE|}$

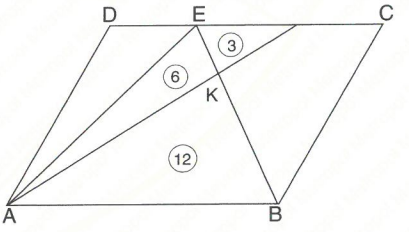
$|CK| = 12$ cm $\Rightarrow |BC| = 12$ cm

$|DK| = 8$ cm $\Rightarrow |DC| = |AB| = 20$ cm

$\Rightarrow |AE| = x = 16$ cm

**Yanıt / Answer E**

**12.**




$\widehat{EFK} \sim \widehat{AKB}$

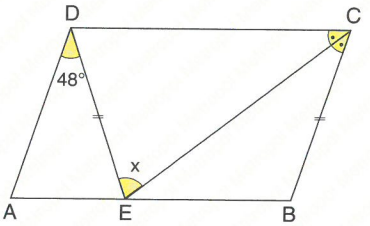
$\frac{A(\widehat{KEF})}{A(\widehat{ABK})} = \frac{3}{12} = \frac{1}{4} \Rightarrow \frac{|FK|}{|AK|} = k = \frac{1}{2}$

$A(\widehat{AEK}) = 6\ cm^2 \Rightarrow A(ABCD) = 2 \cdot A(\widehat{AEB})$

$= 2 \cdot 18 = 36\ cm^2$

**Yanıt / Answer A**

**1.**



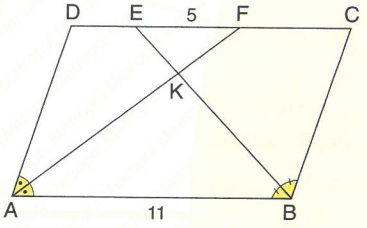

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$m(\widehat{DCE}) = m(\widehat{ECB})$, $|DE| = |BC|$, $m(\widehat{ADE}) = 48°$

$\Rightarrow$ **$m(\widehat{DEC}) = x = ?$**

A) 62° B) 66° C) 72° D) 76° E) 81°

**2.**



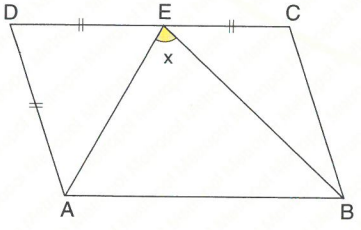

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$m(\widehat{DAF}) = m(\widehat{FAB})$, $m(\widehat{CBE}) = m(\widehat{EBA})$, $|EF| = 5$ cm

$|AB| = 11$ cm $\Rightarrow$ **$|AD| = ?$ cm**

A) 6 B) 7 C) 8 D) 9 E) 10

**3.**

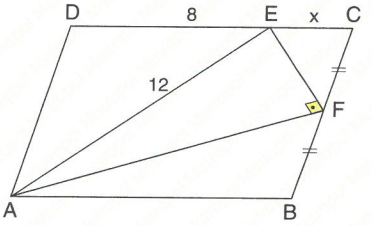



ABCD bir paralelkenardır. / ABCD is a parallelogram.

$|AD| = |DE| = |EC| \Rightarrow$ **$m(\widehat{AEB}) = x = ?$**

A) 72° B) 76° C) 84° D) 90° E) 92°

**4.**

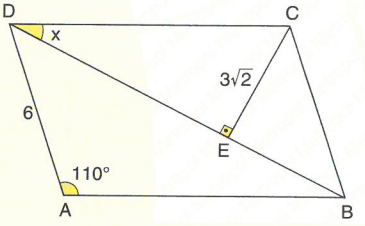



ABCD bir paralelkenardır. / ABCD is a parallelogram.

$[EF] \perp [AF]$, $|AE| = 12$ cm, $|DE| = 8$ cm $\Rightarrow$ **$|EC| = ?$ cm**

A) 1 B) 2 C) 3 D) 4 E) 5

**5.**



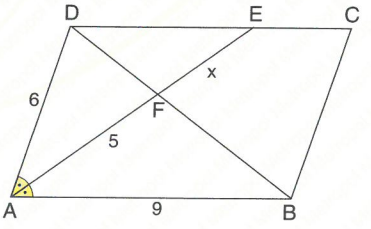

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$[CE] \perp [DB]$, $|AD| = 6$ cm, $|CE| = 3\sqrt{2}$ cm,

$m(\widehat{DAB}) = 110° \Rightarrow$ **$m(\widehat{BDC}) = x = ?$**

A) 15° B) 20° C) 25° D) 30° E) 35°

**6.**



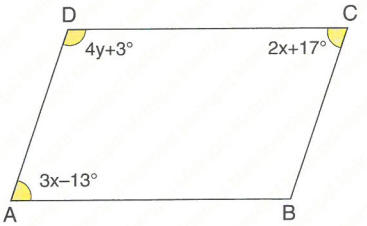

ABCD bir paralelkenardır. /ABCD is a parallelogram.

$|AD| = 6$ cm, $|AB| = 9$ cm, $|AF| = 5$cm

$\Rightarrow$ **$|EF| = x = ?$ cm**

A) $\frac{10}{3}$ B) 4 C) $\frac{13}{3}$ D) 5 E) $\frac{16}{3}$

**7.**



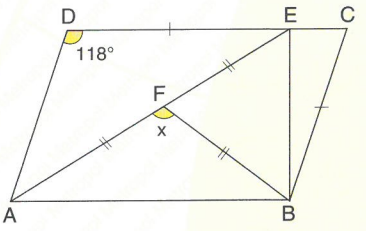

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$m(\widehat{DCB}) = 2x + 17°$, $m(\widehat{DAB}) = 3x - 13°$

$m(\widehat{ADC}) = 4y + 3° \Rightarrow$ **x + y = ?**

A) 45° B) 48° C) 52° D) 55° E) 64°

**8.**



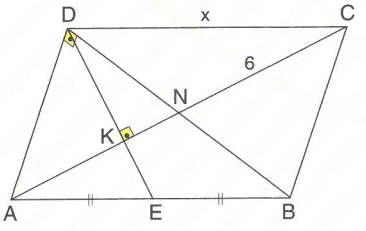

ABCD bir paralelkenardır. / ABCD is a parallelogram.

IBCI = IDEI, IEFI = IFAI = IFBI, $m(\widehat{ADE}) = 118°$,

$\Rightarrow$ **$m(\widehat{AFB})$ = x = ?**

A) 102° B) 108° C) 112° D) 116° E) 118°

**9.**



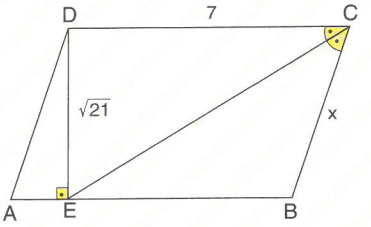

ABCD bir paralelkenardır. / ABCD is a parallelogram.

IAEI = IEBI, [DK] ⊥ [AC], [AD] ⊥ [DB], INCI = 6 cm

$\Rightarrow$ **IDCI = x = ? cm**

A) $7\sqrt{2}$ B) $6\sqrt{2}$ C) 12 D) $9\sqrt{2}$ E) 18

**10.**



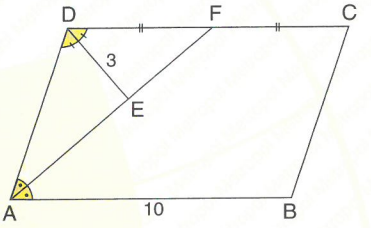

ABCD bir paralelkenardır. /ABCD is a parallelogram.

$m(\widehat{DCE}) = m(\widehat{ECB})$, [DE] ⊥ [AB], IDCI = 7 cm,

IDEI = $\sqrt{21}$ cm $\Rightarrow$ **IBCI = x = ? cm**

A) $3\sqrt{2}$ B) 5 C) $3\sqrt{3}$ D) 6 E) $4\sqrt{2}$

**11.**



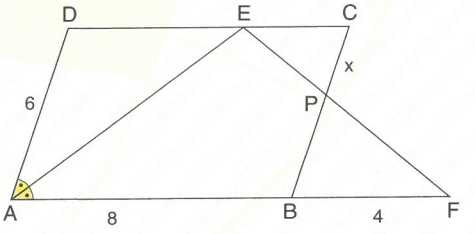

ABCD bir paralelkenardır. / ABCD is a parallelogram.

$m(\widehat{DAF}) = m(\widehat{FAB})$, $m(\widehat{ADE}) = m(\widehat{EDF})$, IDFI = IFCI,

IDEI = 3 cm, IABI = 10 cm $\Rightarrow$ **A(ABCD) = ? cm²**

A) 24 B) 36 C) 48 D) 72 E) 96

**12.**




ABCD bir paralelkenardır. / ABCD is a parallelogram.

$m(\widehat{DAE}) = m(\widehat{EAF})$, IADI = 6 cm, IABI = 8 cm

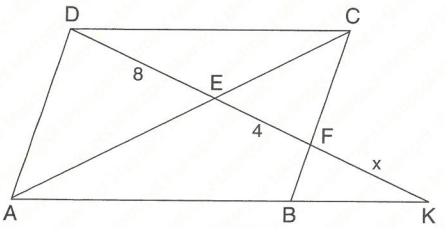
IBFI = 4 cm $\Rightarrow$ **IPCI = x = ? cm**

A) 1 B) $\frac{3}{2}$ C) 2 D) $\frac{5}{2}$ E) 3

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | C | D | B | C | A | D | E | B | B | C | C |

**1.**

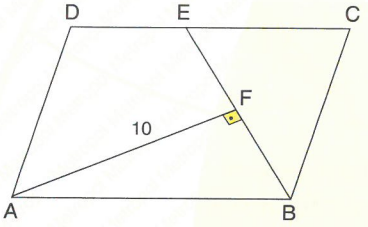



ABCD bir paralelkenardır. / ABCD is a parallelogram.

IDEI = 8 cm, IEFI = 4 cm ⇒ **IFKI = x = ? cm**

A) 8 B) 9 C) 10 D) 11 E) 12

**2.**



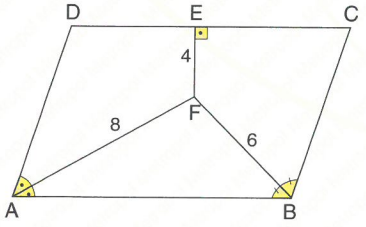

ABCD bir paralelkenardır. / ABCD is a parallelogram.

[AF] ⊥ [EB], IEBI = 7 cm, IAFI = 10 cm

⇒ **A(ABCD) = ? cm²**

A) 35 B) 56 C) 70 D) 84 E) 91

**3.**




ABCD bir paralelkenardır. / ABCD is a parallelogram.

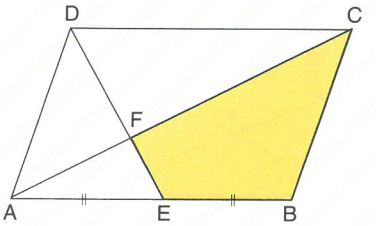
[FE] ⊥ [DC], m($\widehat{DAF}$) = m($\widehat{FAB}$), m($\widehat{ABF}$) = m($\widehat{FBC}$),

IAFI = 8 cm, IFBI = 6 cm, IEFI = 4 cm

⇒ **A(ABCD) = ? cm²**

A) 44 B) 48 C) 56 D) 64 E) 88

**4.**

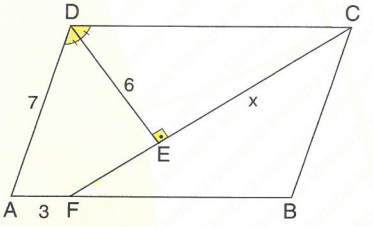



ABCD bir paralelkenardır. / ABCD is a parallelogram.

IAEI = IEBI, A(ABCD) = 72 cm² ⇒ **A(FEBC) = ? cm²**

A) 24 B) 26 C) 28 D) 30 E) 32

**5.**



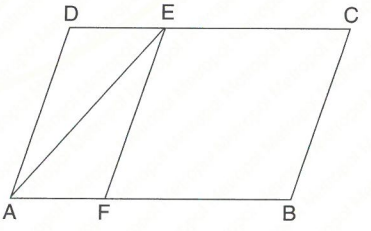

ABCD bir paralelkenardır. / ABCD is a parallelogram.

[DE] ⊥ [FC], m($\widehat{ADE}$) = m($\widehat{EDC}$), IDEI = 6 cm,

IADI = 7 cm, IAFI = 3 cm ⇒ **IECI = x = ? cm**

A) 6 B) 7 C) 8 D) 9 E) 10

**6.**



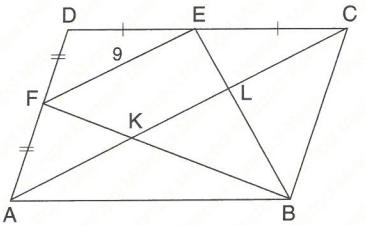

ABCD bir paralelkenardır. / ABCD is a parallelogram.

[EF] // [BC], 2·IAFI = IFBI, A($\widehat{ADE}$) = 14 cm²

⇒ **A(ABCD) = ? cm²**

A) 42 B) 48 C) 56 D) 70 E) 84

**7.**

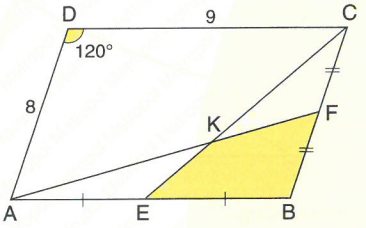



ABCD bir paralelkenardır. / ABCD is a parallelogram.

IFDI = IFAI, IEDI = IECI, IEFI = 9 cm ⇒ **IACI = ? cm**

A) 15 B) 18 C) 21 D) 24 E) 27

**8.**



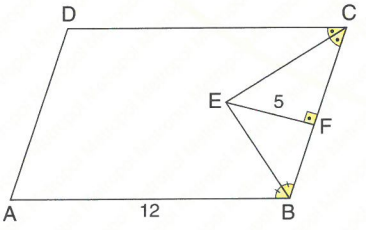

ABCD bir paralelkenardır. / ABCD is a parallelogram.

IAEI = IEBI, IKFI = IBFI, m($\widehat{ADC}$) = 120°, IADI = 8 cm,

IDCI = 9 cm ⇒ **A(EBFK) = ? cm²**

A) $3\sqrt{3}$ B) $4\sqrt{3}$ C) $6\sqrt{3}$ D) $9\sqrt{3}$ E) $12\sqrt{3}$

**9.**



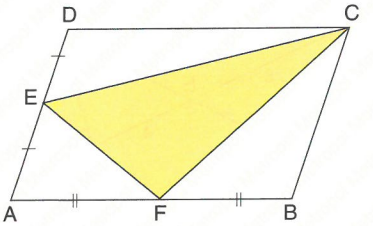

ABCD bir paralelkenardır. / ABCD is a parallelogram.

m($\widehat{ABE}$) = m($\widehat{EBC}$), m($\widehat{DCE}$) = m($\widehat{ECB}$), [EF] ⊥ [BC],

IEFI = 5 cm, IABI = 12 cm ⇒ **A(ABCD) = ? cm²**

A) 60 B) 72 C) 90 D) 112 E) 120

**10.**



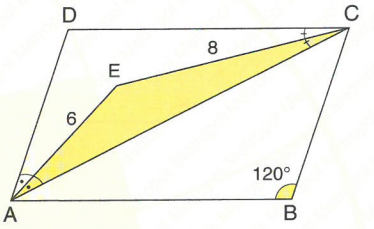

ABCD bir paralelkenardır. / ABCD is a parallelogram.

IDEI = IEAI, IAFI = IFBI, A(ABCD) = 120 cm²

⇒ **A($\widehat{EFC}$) = ? cm²**

A) 30 B) 36 C) 45 D) 60 E) 72

**11.**




ABCD bir paralelkenardır. / ABCD is a parallelogram.

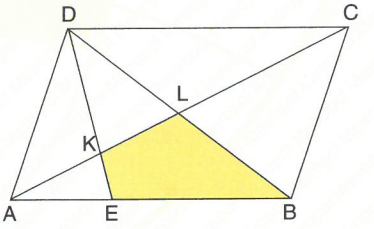
m($\widehat{DAE}$) = m($\widehat{EAC}$), m($\widehat{DCE}$) = m($\widehat{ECA}$),

m($\widehat{ABC}$) = 120°, IEAI = 6 cm, IECI = 8 cm

⇒ **A($\widehat{EAC}$) = ? cm²**

A) 8 B) 9 C) $9\sqrt{3}$ D) 12 E) $12\sqrt{3}$

**12.**




ABCD bir paralelkenardır. / ABCD is a parallelogram.

IABI = 3·IAEI, A(ABCD) = 72 cm²

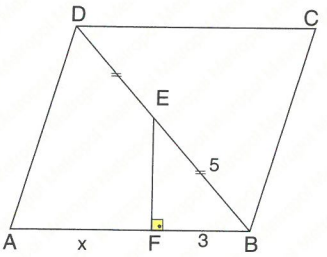
⇒ **A(EBLK) = ? cm²**

A) 12 B) 15 C) 16 D) 18 E) 24

**YANITLAR / ANSWERS**

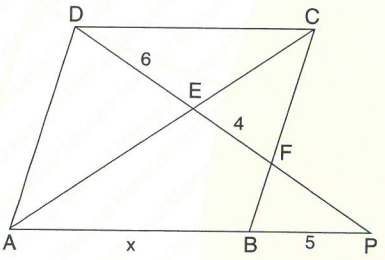
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | C | E | D | C | E | B | C | E | C | D | B |

**1.** ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadrangle.
IDEI = IEBI,
IDEI = 5 cm,
IFBI = 3 cm
⇒ **IAFI = x = ? cm**




A) 5 B) $\frac{16}{3}$ C) 6 D) $\frac{20}{3}$ E) 7

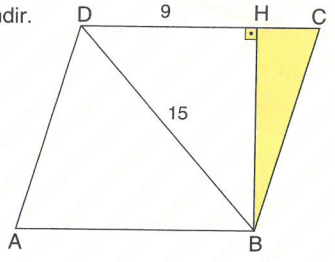
**2.**




ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadrangle.
IDEI = 6 cm, IEFI = 4 cm, IBPI = 5 cm
⇒ **IABI = x = ? cm**

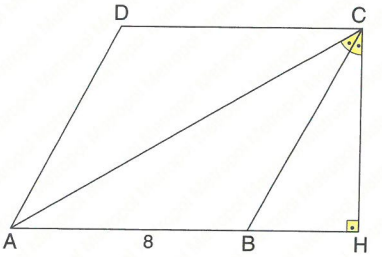
A) 8 B) 9 C) 10 D) 11 E) 12

**3.** ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadrangle.
[BH] ⊥ [DC],
IDHI = 9 cm,
IDBI = 15 cm
⇒ **A($\widehat{BHC}$) = ? cm²**




A) 15 B) 17 C) 18 D) 20 E) 21

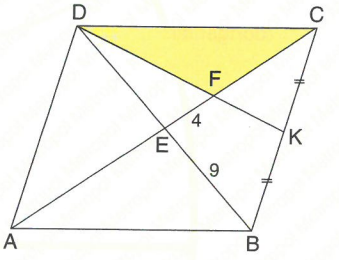
**4.**




ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadrangle.
[CH] ⊥ [AH], IABI = 8 cm ⇒ **A(ABCD) = ? cm²**

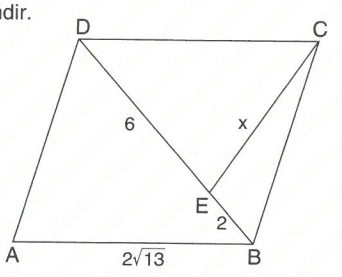
A) $16\sqrt{3}$ B) 24 C) $24\sqrt{3}$ D) 32 E) $32\sqrt{3}$

**5.** ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadrangle.
IBKI = IKCI,
IBEI = 9 cm,
IEFI = 4 cm
⇒ **A($\widehat{DFC}$) = ? cm²**



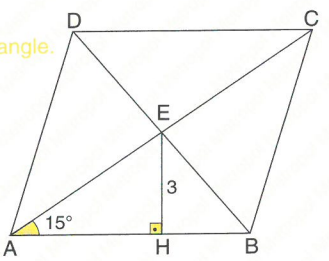

A) 36 B) 48 C) 54 D) 68 E) 72

**6.** ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadrangle
IDEI = 6 cm,
IEBI = 2 cm,
IABI = $2\sqrt{13}$ cm
⇒ **IECI = x = ? cm**



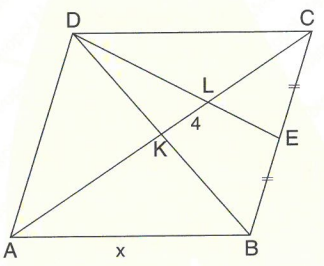

A) $\sqrt{10}$ B) $2\sqrt{10}$ C) $3\sqrt{10}$ D) $6\sqrt{3}$ E) $8\sqrt{3}$

**7.** ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadrangle.
[EH] ⊥ [AB],
$m(\widehat{EAB}) = 15°$,
IEHI = 3 cm
⇒ **A(ABCD) = ? cm²**



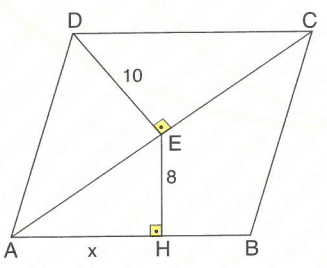

A) 36 B) 48 C) 56 D) 64 E) 72

**8.** ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadrangle.
IKLI = 4 cm,
IDBI = 18 cm
⇒ **IABI = x = ? cm**



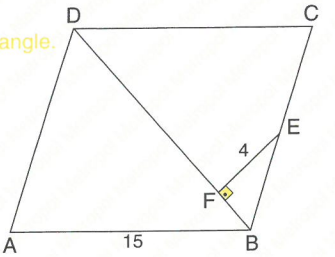

A) 9 B) 10 C) 12 D)15 E) 20

**9.** ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadrangle.
[DE] ⊥ [AC],
[EH] ⊥ [AB],
IDEI = 10 cm,
IEHI = 8 cm
⇒ **IAHI = x = ? cm**



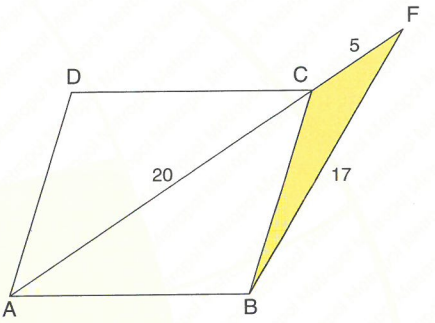

A) 9 B) $\frac{32}{3}$ C) 10 D) $\frac{34}{3}$ E) 12

**10.** ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadrangle.
2·IEBI = ICEI,
IEFI = 4 cm, IABI = 15 cm
⇒ **A(ABCD) = ? cm²**




A) 144 B) 156 C) 180 D) 196 E) 216

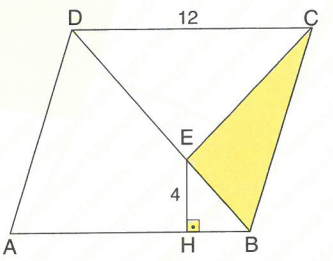
**11.**




ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadrangle.
IBFI = 17 cm, ICFI = 5 cm, IACI = 20 cm
⇒ **A($\widehat{BFC}$) = ? cm²**

A) 15 B) 20 C) 25 D) 30 E) 40

**12.**




ABCD bir eşkenar dörtgendir.
ABCD is an equilateral quadrangle.
[EH] ⊥ [AB], IDCI = 12 cm, IEHI = 4 cm
⇒ **A($\widehat{BCE}$) = ? cm²**

A) 12 B) 16 C) 18 D) 24 E) 36

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | C | E | E | A | B | E | D | B | E | B | D |

# BÖLÜM CHAPTER 9

## TARİHSEL NOT / HISTORICAL NOTE

### John Horton Conway [1937 – ]

Sınırlı grupların teorilerinde, düğüm teorisinde, sayı teorisinde, kombinasyonal oyun teorisinde ve kodlama teorisinde katkısı bulunan matematikçidir. Conway Princeton Üniversitesinde şu anda matematik profesörüdür. Cambridge Harold Davenport altında araştırmaya başlamıştır. Erdös sayısından birine sahiptir

Productive and active mathematician in the fields of limited groups theory, nodal theory, number theory, combinational game theory and coding theory. Conway is currently a professor of mathematics at Princeton University. He began the investigative study supervised by Harold Davenport in Cambridge. He has one of the Erdos numbers.

# DİKDÖRTGEN ve KARE
# RECTANGLES and SQUARE

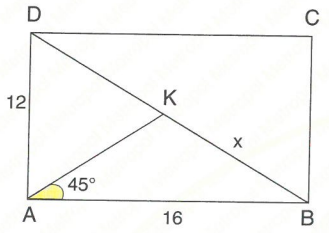
**Bu bölüm 60 çözümlü test sorusu ve 48 test sorusu içermektedir.**

**This chapter includes 60 test questions with solutions and 48 test questions.**

**BÖLÜM / CHAPTER 9**

**DİKDÖRTGEN ve KARE / RECTANGLES and SQUARE**

**1.**



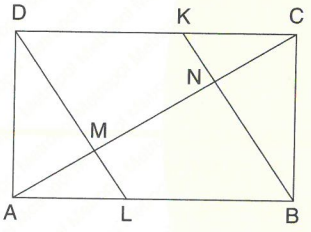

ABCD bir dikdörtgendir. / ABCD is a rectangle.

IADI = 12 cm, IABI = 16 cm, m($\widehat{KAB}$) = 45°

⇒ **IKBI = x = ? cm**

A) 7 B) 8 C) $\frac{75}{7}$ D) 11 E) $\frac{80}{7}$

**2.**



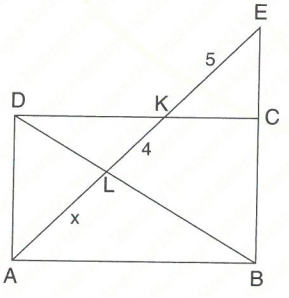

ABCD bir dikdörtgendir. / ABCD is a rectangle.

IALI = ILBI, IDKI = IKCI, IABI = 12 cm,

IBCI = 9 cm ⇒ **IMNI = ? cm**

A) 8 B) 6 C) 5 D) 4 E) 3

**3.**

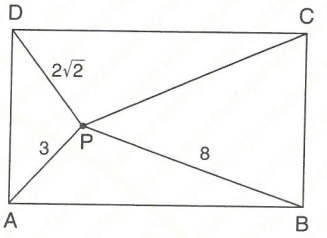



ABCD bir dikdörtgendir. / ABCD is a rectangle.

IKEI = 5 cm, ILKI = 4 cm ⇒ **IALI = x = ? cm**

A) 4 B) 5 C) 6 D) 7 E) 8

**4.**



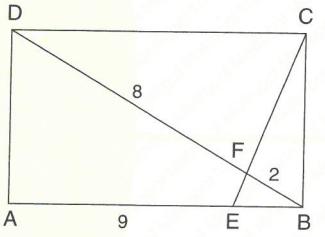

ABCD bir dikdörtgendir. / ABCD is a rectangle.

IAPI = 3 cm, IDPI = $2\sqrt{2}$ cm, IPBI = 8 cm

⇒ **IPCI = ? cm**

A) 3 B) $3\sqrt{3}$ C) $3\sqrt{5}$ D) $3\sqrt{7}$ E) 9

**5.**

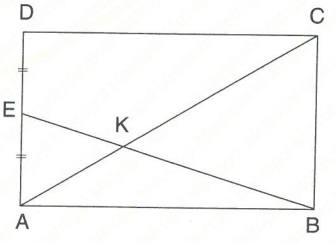



ABCD bir dikdörtgendir. / ABCD is a rectangle.

IAEI = 9 cm, IDFI = 8 cm, IFBI = 2 cm ⇒ **IEBI = ? cm**

A) 1 B) 2 C) 3 D) 4 E) 5

**6.**

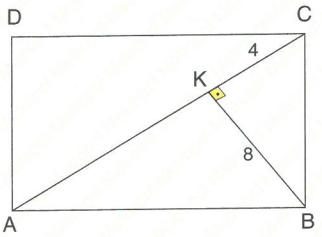



ABCD bir dikdörtgendir. /ABCD is a rectangle.

IAEI = IEDI = 8 cm, IABI = 15 cm ⇒ **IKEI = ? cm**

A) $\frac{17}{3}$ B) $\frac{16}{3}$ C) 5 D) $\frac{14}{3}$ E) 4

**7.**

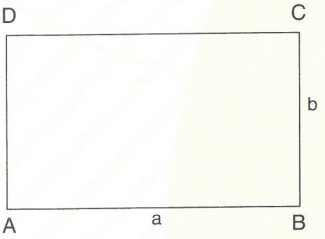



ABCD bir dikdörtgendir. / ABCD is a rectangle.

IKBI = 8 cm, IKCI = 4 cm ⇒ **IABI = ? cm**

A) $8\sqrt{2}$ B) $8\sqrt{3}$ C) $8\sqrt{5}$ D) $8\sqrt{7}$ E) 24

**8.**



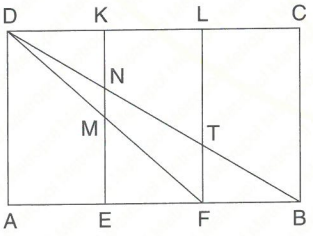

ABCD bir dikdörtgendir. (ABCD) / ABCD is a rectangle.

Çevre/ The perimeter = 32 cm

$\frac{1}{a}+\frac{1}{b}=\frac{8}{15}$ ⇒ **a · b = ? cm²**

A) 44 B) 48 C) 60 D) 72 E) 84

**9.**



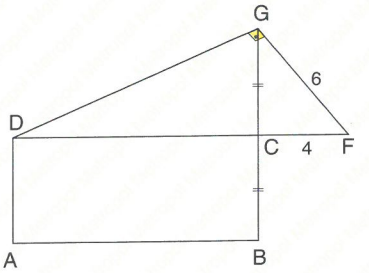

ABCD bir dikdörtgendir. / ABCD is a rectangle.

IAEI = IEFI = IFBI = IBCI = ICLI = ILKI = IKDI,

ICBI = 24 cm ⇒ **ITFI = ? cm**

A) 6 B) 7 C) 8 D) 9 E) 10

**10.**




ABCD bir dikdörtgendir. / ABCD is a rectangle.

[DG] ⊥ [GF], IGCI = ICBI, ICFI = 4 cm, IGFI = 6 cm

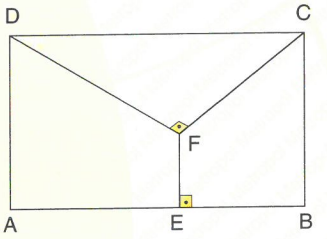
**Çevre / The perimeter (ABCD) = ? cm**

A) $2(5 + 2\sqrt{5})$ B) $5(2 + \sqrt{5})$

C) $2(2 + 5\sqrt{5})$ D) $2(5 + \sqrt{5})$

E) $2(5 + 3\sqrt{5})$

**11.**



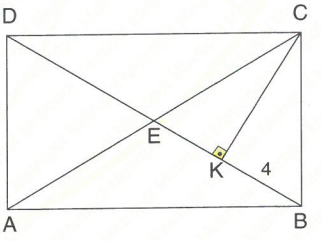

ABCD bir dikdörtgendir. / ABCD is a rectangle.

[DF] ⊥ [BC], [FE] ⊥ [AB], IABI = 10 cm,

IEFI = 4 cm, IADI = 8 cm ⇒ **A(ABCFD) = ? cm²**

A) 40 B) 50 C) 60 D) 70 E) 80

**12.**




ABCD bir dikdörtgendir. / ABCD is a rectangle.

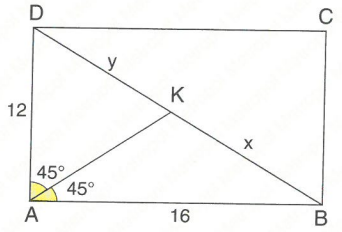
IKBI = 4 cm, ICKI = $4\sqrt{3}$ cm ⇒ **IEKI = ? cm**

A) 4 B) 5 C) 6 D) 7 E) 8

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | C | C | D | C | A | C | B | C | A | C | A |

**1.**




$|DB|^2 = 12^2 + 16^2$ [Pythagor]

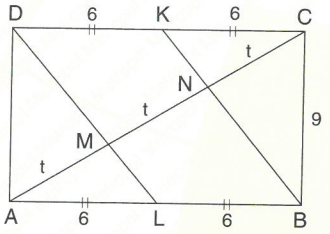
$|DB| = 20 \Rightarrow x + y = 20$ cm

[AK] bir açıortaydır. / [AK] is a bisector.

$\frac{12}{16} = \frac{y}{x} \Rightarrow \frac{y}{x} = \frac{3}{4} \Rightarrow \frac{20}{x} = \frac{7}{4} \Rightarrow x = \frac{80}{7}$

**Yanıt / Answer E**

**2.**




$\left.\begin{array}{l}|AL| = |LB| \\ |DK| = |KC|\end{array}\right\} \Rightarrow |MA| = |MN| = |NC|$

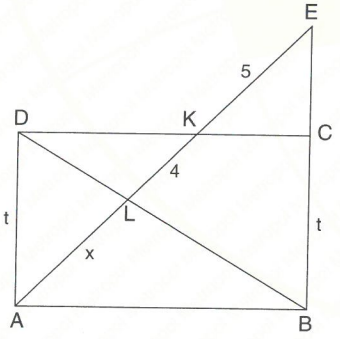
$|AC|^2 = 9^2 + 12^2$ [Pythagor]

$|AC| = 15$ cm

$|MN| = \frac{|AC|}{3} = \frac{15}{3} = 5$ cm

**Yanıt / Answer C**

**3.**

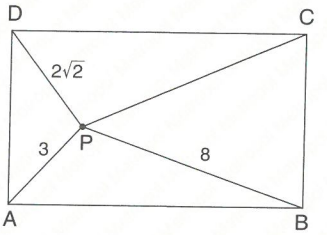



$|AL|^2 = |LK| \cdot |LE|$

$x^2 = 4 \cdot 9 = 36 \Rightarrow x = 6$ cm

**Yanıt / Answer C**

**4.**



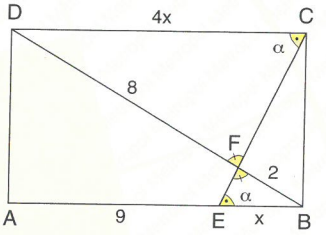

$|PD|^2 + |PB|^2 = |PA|^2 + |PC|^2$

$8 + 64 = 9 + |PC|^2$

$|PC| = \sqrt{63} = 3\sqrt{7}$ cm

**Yanıt / Answer D**

**5.**



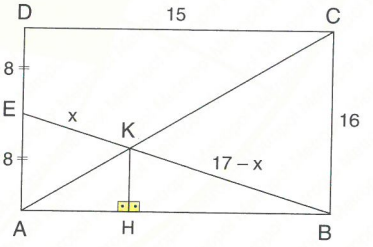

$\widehat{DFC} \sim \widehat{FEB} \Rightarrow \frac{|DC|}{|EB|} = \frac{8}{2} = 4$

$|DC| = |EB| + |AE|$

$4x = x + 9 \Rightarrow 3x = 9 \Rightarrow x = 3$ cm

**Yanıt / Answer C**

**6.**




$|EB| = \sqrt{8^2 + 15^2} = 17$ cm [Pythagor]

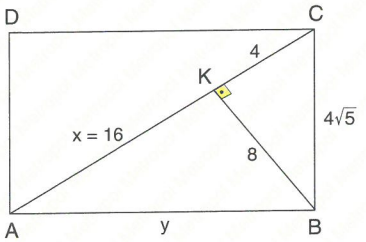
$\widehat{AKE} \sim \widehat{CKB} \Rightarrow \frac{|EA|}{|CB|} = \frac{|EK|}{|KB|}$

$\frac{8}{16} = \frac{x}{17-x}$

$3x = 17 \Rightarrow x = \frac{17}{3}$ cm

**Yanıt / Answer A**

**7.**




$4x = 8^2$ [Euclid ]

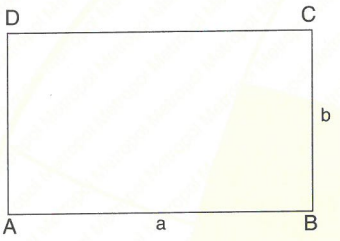
$x = 16$ cm

$y^2 = 16^2 + 8^2$ $y = 8\sqrt{5}$ cm

$|AB| = 8\sqrt{5}$ cm

**Yanıt / Answer C**

**8.**




$2(a+b) = 32$ cm

$a + b = 16$

$a = 3k$ $4k = 16$

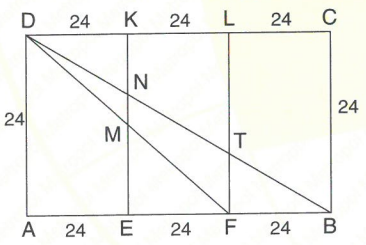
$b = k$ $k = 4$

$\Rightarrow$ $a = 12$, $b = 4$

$A(ABCD) = 4 \cdot 12 = 48\ cm^2$

**Yanıt / Answer B**

**9.**




$\widehat{TFB} \sim \widehat{DBA}$

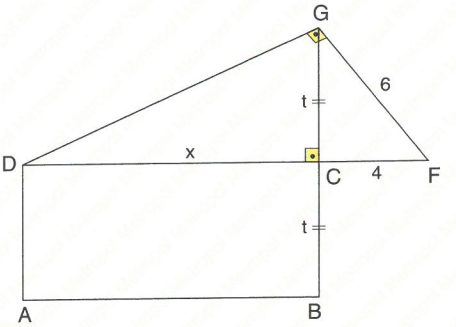
$\frac{|TF|}{|DA|} = \frac{|BF|}{|BA|} \Rightarrow \frac{|TF|}{24} = \frac{24}{72}$

$|TF| = \frac{24 \cdot 24}{72}$

$|TF| = 8$ cm

**Yanıt / Answer C**

**10.**




$t = \sqrt{6^2 - 4^2} = 2\sqrt{5}$ cm

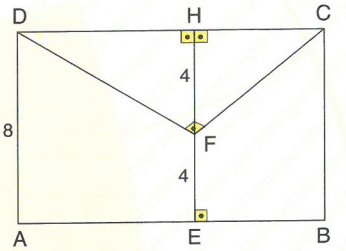
$t^2 = 4 \cdot x$ [Euclid ]

$20 = 4x \Rightarrow x = 5$ cm

$\Rightarrow$ Çevre / The perimeter (ABCD) $= 2(x + t) = 2(5 + 2\sqrt{5})$ cm

**Yanıt / Answer A**

**11.**




E, F, H doğrusaldır. / E, F, H points are in the same line.

$|FH| = 8 - 4 = 4$ cm

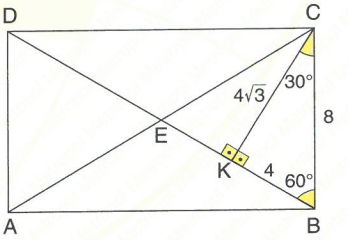
$A(\widehat{DFC}) = \frac{4 \cdot 10}{2} = 20\ cm^2$

$A(ABCD) = 8 \cdot 10 = 80\ cm^2$

$A(ABCFD) = 80 - 20 = 60\ cm^2$

**Yanıt / Answer C**

**12.**



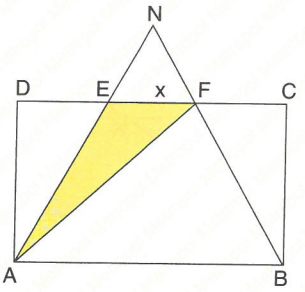

$|CK|^2 = |DK| \cdot |KB|$ [Euclid ]

$48 = |DK| \cdot 4 \Rightarrow |DK| = 12$ cm

$\left.\begin{array}{l} |KB| = 4 \text{ cm} \\ |DE| = \frac{12+4}{2} = 8 \text{ cm} \end{array}\right\} \Rightarrow |EK| = 12 - 8 = 4$ cm

**Yanıt / Answer A**

**1.**




ABCD bir dikdörtgendir. / ABCD is a rectangle.

$A(\widehat{AEF}) = 12\ cm^2$, $|BC| = 4$ cm $\Rightarrow$ **$|EF| = x = ?$ cm**

A) 3 B) 4 C) 5 D) 6 E) 9

**2.** ABCD bir dikdörtgendir.

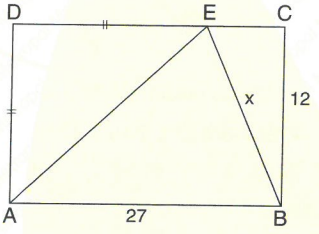
ABCD is a rectangle.

$|AD| = |DE|$

$|AB| = 27$ cm,

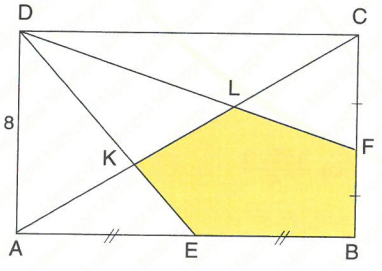
$|BC| = 12$ cm

$\Rightarrow$ **$|BE| = x = ?$ cm**




A) $5\sqrt{6}$ B) $3\sqrt{41}$ C) $4\sqrt{17}$ D) $9\sqrt{3}$ E) $12\sqrt{2}$

**3.**




ABCD bir dikdörtgendir. / ABCD is a rectangle.

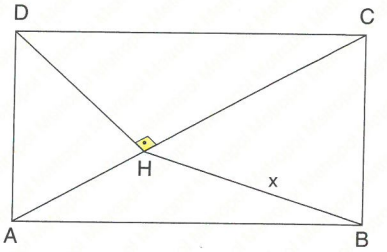
$|AE| = |EB|$, $|BF| = |FC|$,

$[DE] \cap [AC] = \{K\}$, $[DF] \cap [AC] = \{L\}$,

$|AD| = 8$ cm, $A(EBFLK) = 32\ cm^2 \Rightarrow$ **$|DC| = ?$ cm**

A) 12 B) 15 C) 16 D) 18 E) 24

**4.**

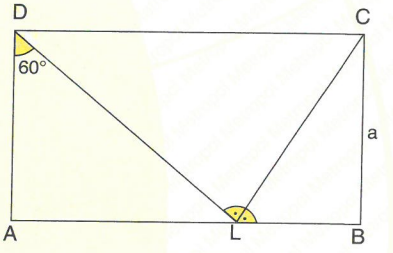



ABCD bir dikdörtgendir. / ABCD is a rectangle.

$|CH| = 16$ cm, $|DH| = 8$ cm, $[DH] \perp [AC] \Rightarrow$ **$|BH| = x = ?$ cm**

A) 9 B) 12 C) $4\sqrt{13}$ D) $6\sqrt{6}$ E) $6\sqrt{10}$

**5.**



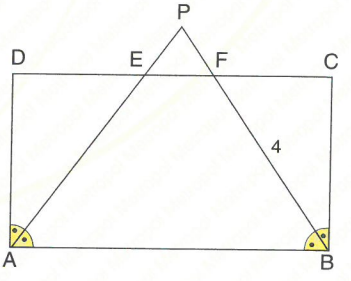

ABCD bir dikdörtgendir. / ABCD is a rectangle.

$m(\widehat{ADL}) = 60°$, $m(\widehat{DLC}) = m(\widehat{CLB})$, $A(ABCD) = 128\ cm^2$

$\Rightarrow$ **Çevre / The perimeter (ABCD) = ? cm**

A) 72 B) 64 C) 52 D) 48 E) 30

**6.**



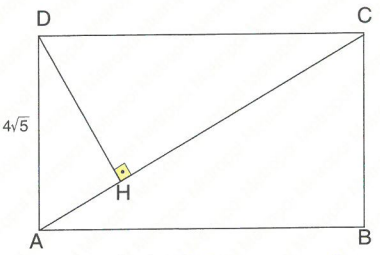

ABCD bir dikdörtgendir. / ABCD is a rectangle.

$m(\widehat{DAP}) = m(\widehat{PAB})$, $m(\widehat{ABP}) = m(\widehat{PBC})$, $|FB| = 4$ cm,

$A(ABCD) = 48\ cm^2 \Rightarrow$ **Çevre / The perimeter $(\widehat{PAB})$ = ? cm**

A) 48 B) $12(2 + \sqrt{2})$ C) 36 D) $16(1 + \sqrt{2})$ E) $8(4 + \sqrt{2})$

**7.**



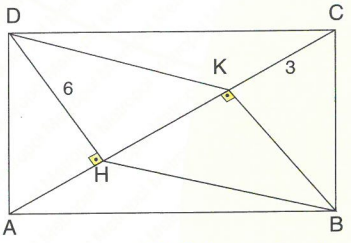

ABCD bir dikdörtgendir. / ABCD is a rectangle.

$[DH] \perp [AC]$, $|AD| = 4\sqrt{5}$ cm,

$4 \cdot |AH| = |HC| \Rightarrow$ **A(ABCD) = ? cm²**

A) 96 B) 120 C) 140 D) 150 E) 160

**8.**



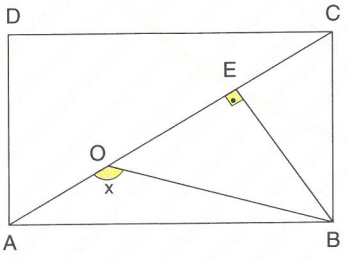

ABCD bir dikdörtgendir. / ABCD is a rectangle.

$[DH] \perp [AC]$, $[BK] \perp [AC]$, $|DH| = 6$ cm, $|CK| = 3$ cm

$\Rightarrow$ **A(DHBK) = ? cm²**

A) 27 B) 36 C) 48 D) 54 E) 108

**9.**



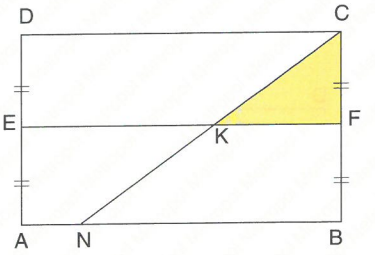

ABCD bir dikdörtgendir. / ABCD is a rectangle.

$O, E \in [AC]$, $|AO| = |OE|$, $[BE] \perp [AC]$, $|AB| = 2 \cdot |AD|$

$\Rightarrow$ **$m(\widehat{AOB}) = x = ?$**

A) 105 B) 120 C) 135 D) 150 E) 165

**10.**



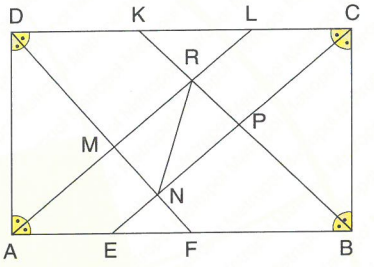

ABCD bir dikdörtgendir. / ABCD is a rectangle.

$|BF| = |FC|$, $|AE| = |ED|$, $[EF] \cap [CN] = \{K\}$,

$2 \cdot |EK| = 3 \cdot |KF|$, $A(\widehat{CKF}) = 8$ cm² $\Rightarrow$ **A(ANCD) = ? cm²**

A) 48 B) 72 C) 88 D) 96 E) 108

**11.**

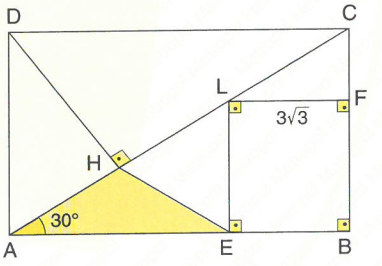



ABCD bir dikdörtgendir. / ABCD is a rectangle.

$|CE| = 8\sqrt{2}$ cm, $|NR| = 4$ cm $\Rightarrow$ **A(ABCD) = ? cm**

A) $48\sqrt{2}$ B) $54\sqrt{2}$ C) 72 D) 84 E) 96

**12.**




ABCD bir dikdörtgendir. / ABCD is a rectangle.

EBFL bir dikdörtgendir. / EBFL is a rectangle.

$m(\widehat{CAB}) = 30°$, $|LF| = 3\sqrt{3}$ cm,

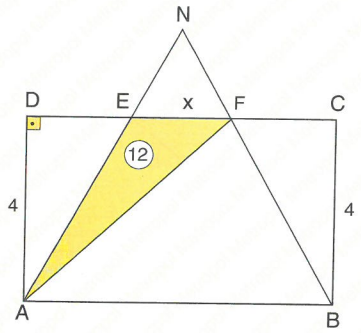
$|AL| = 5 \cdot |LC| \Rightarrow$ **$A(\widehat{AHE}) = ?$ cm²**

A) $\frac{115\sqrt{3}}{4}$ B) $\frac{120\sqrt{3}}{5}$ C) $\frac{135\sqrt{3}}{4}$ D) $\frac{155\sqrt{3}}{4}$ E) $\frac{165\sqrt{3}}{4}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | B | A | C | D | B | E | D | C | A | E | C |

**1.**

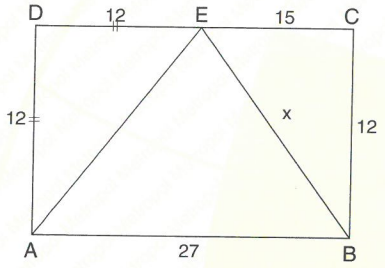



$A(\widehat{AEF}) = \frac{4.x}{2} = 12$ cm

$12 = \frac{4x}{2} \Rightarrow x = 6$ cm

**Yanıt / Answer D**

**2.**



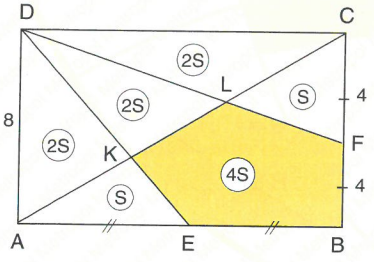

$x^2 = 12^2 + 15^2$ [Pythagor]

$x^2 = 144 + 225 = 369$

$x = 3\sqrt{41}$ cm

**Yanıt / Answer B**

**3.**



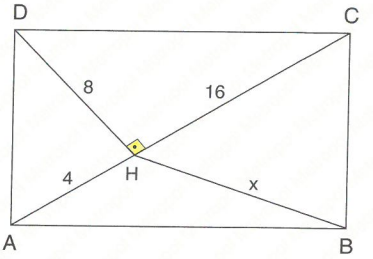

$4S = 32 \Rightarrow S = 8$ cm$^2$

$A(ABCD) = 12S = 12 \cdot 8 = 96$ cm$^2$

$A(ABCD) = 8 \cdot |DC| = 96$ cm $\Rightarrow |DC| = 12$ cm

**Yanıt / Answer A**

**4.**




$|DH|^2 = |AH| \cdot |HC|$ [Euclid]

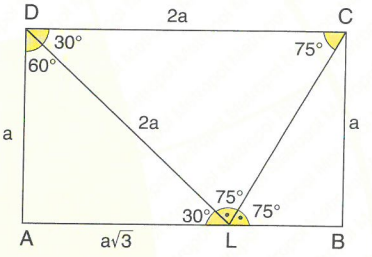
$64 = 16 \cdot |AH| \Rightarrow |AH| = 4$ cm

$8^2 + x^2 = 4^2 + 16^2$

$x^2 = 208 \Rightarrow x = 4\sqrt{13}$ cm

**Yanıt / Answer C**

**5.**



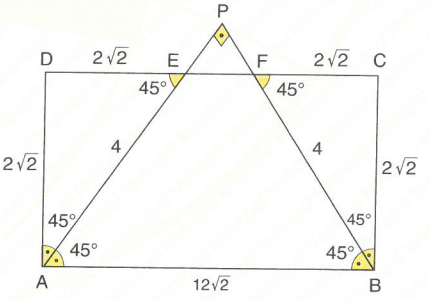

$A(ABCD) = a \cdot 2a = 128$ cm$^2$

$a^2 = 64 \Rightarrow a = 8$ cm

Çevre / The perimeter (ABCD) = 48 cm

**Yanıt / Answer D**

**6.**




$|FB| = 4$ cm $\Rightarrow |FC| = |CB| = 2\sqrt{2}$ cm

$A(ABCD) = (2\sqrt{2}) \cdot |AB| = 48$ cm$^2$

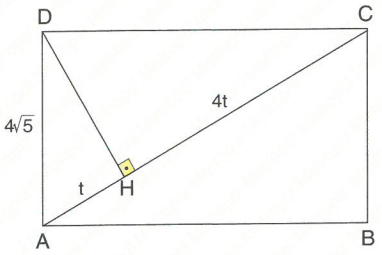
$|AB| = 12\sqrt{2}$ cm

$|PA| = |PB| = 12$ cm

Çevre / The perimeter $(\widehat{PAB}) = 12(2 + \sqrt{2})$ cm

**Yanıt / Answer B**

**7.**




$(4\sqrt{5})^2 = t \cdot 5t$ [Euclid]

$16.5 = 5t^2 \Rightarrow t = 4$ cm

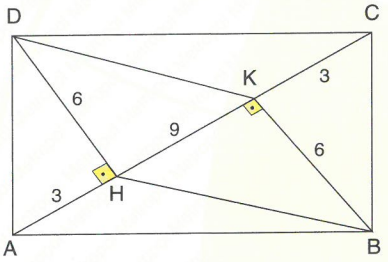
$|DC| = \sqrt{20^2 - (4\sqrt{5})^2}$ [Pythagor]

$|DC| = \sqrt{320} = 8\sqrt{5}$ cm

$A(ABCD) = 4\sqrt{5} \cdot 8\sqrt{5} = 160$ cm$^2$

**Yanıt / Answer E**

**8.**




$|DH| = |BK| = 6$ cm

$|KC| = |AH| = 3$ cm

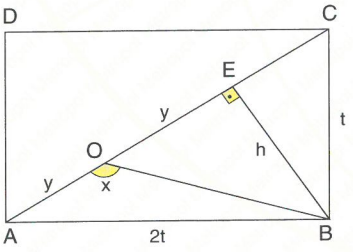
$6^2 = |AH| \cdot |HC|$ [Euclid]

$36 = 3 \cdot |HC| \Rightarrow |HC| = 12 \Rightarrow |HK| = 9$ cm

$\Rightarrow A(DHBK) = 2 \cdot \left(\frac{9 \cdot 6}{2}\right) = 54$ cm$^2$

**Yanıt / Answer D**

**9.**



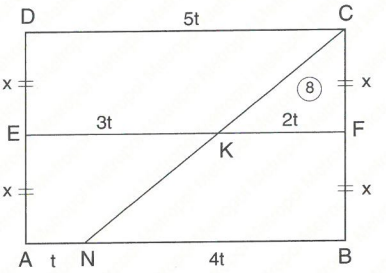

$\widehat{AEB} \sim \widehat{ABC} \Rightarrow \frac{h}{t} = \frac{2y}{2t} \Rightarrow h = y$

$|OE| = |EB|$

$\Rightarrow m(\widehat{EOB}) = 45° \Rightarrow m(\widehat{AOB}) = x = 135°$

**Yanıt / Answer C**

**10.**




$\frac{x \cdot 2t}{2} = 8 \Rightarrow x \cdot t = 8$

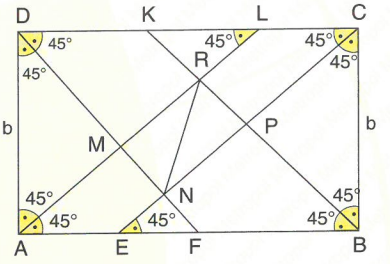
$A(ABCD) = 2x \cdot 5t = 80$ cm$^2$

$A(\widehat{CNB}) = \frac{2x \cdot 4t}{2} = 32$ cm$^2$

$A(ANCD) = 80 - 32 = 48$ cm$^2$

**Yanıt / Answer A**

**11.**




MNPR bir karedir. / MNPR is a square.

$|RN| = |MP| = a - b$

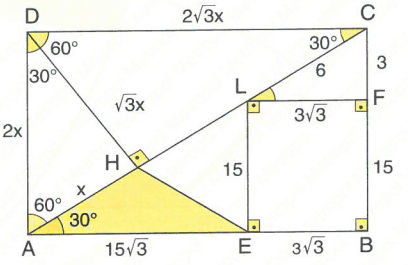
$|EC| = 8\sqrt{2}$ cm $\Rightarrow b = 8$ cm

$4 = a - 8 \Rightarrow |AB| = 12$ cm

$\Rightarrow A(ABCD) = 12 \cdot 8 = 96$ cm$^2$

**Yanıt / Answer E**

**12.**




$|AL| = 30$ cm, $|LE| = 15$ cm

$2x = 18 \Rightarrow x = 9$ cm

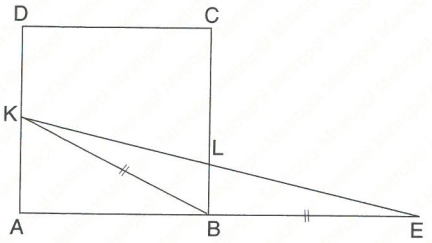
$|AE| = 15\sqrt{3}$ cm

$A(\widehat{AHE}) = \frac{1}{2} \cdot 9 \cdot 15\sqrt{3} \cdot \sin 30°$

$A(\widehat{AHE}) = \frac{135\sqrt{3}}{4}$ cm$^2$

**Yanıt / Answer C**

**1.**

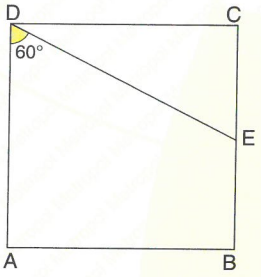



ABCD bir karedir. / ABCD is a square.

IBEI = IBKI = 2·IKAI ⇒ **m($\widehat{LKB}$) = ?**

A) 30° B) 25° C) 20° D) 15° E) 10°

**2.**



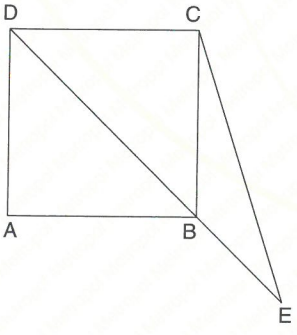

ABCD bir karedir. / ABCD is a square.

m($\widehat{ADE}$) = 60°, IDEI = $8\sqrt{3}$ br(u)

**Çevre / The perimeter (ABCD) = ? br(u)**

A) 64 B) 56 C) 48 D) 36 E) 32

**3.**



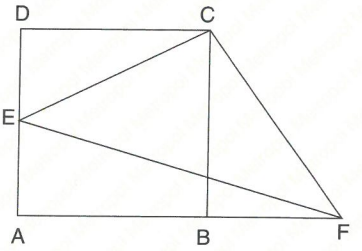

ABCD bir karedir. / ABCD is a square.

Çevre / The perimeter (ABCD) = 32 cm,

IBEI = $4\sqrt{2}$ cm ⇒ **ICEI = ? cm**

A) $2\sqrt{10}$ B) $4\sqrt{5}$ C) $4\sqrt{10}$ D) $5\sqrt{10}$ E) $6\sqrt{10}$

**4.**

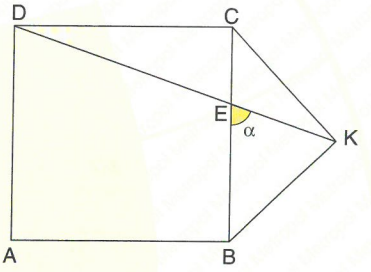



ABCD bir karedir. / ABCD is a square.

IDEI = IEAI = IBFI, ICFI = 5 cm ⇒ **IECI = ? cm**

A) 5 B) 4 C) 3 D) 2 E) 1

**5.**



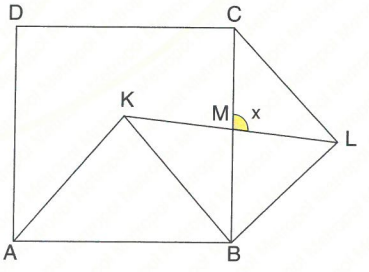

ABCD bir kare, CBK eşkenar üçgendir.

ABCD is a square, CBK is an equilateral triangle.

⇒ **m($\widehat{BEK}$) = α = ?**

A) 35° B) 45° C) 60° D) 75° E) 85°

**6.**



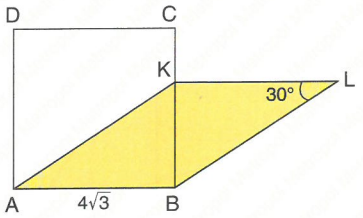

ABCD bir kare, CBL ve AKB birer eşkenar üçgendir.

ABCD is a square, CBL and AKB are equilateral triangles.

⇒ **m($\widehat{CML}$) = ?**

A) 95° B) 100° C) 103° D) 105° E) 110°

**7.**



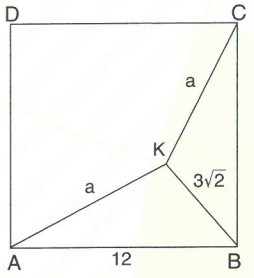

ABCD bir kare, ABLK bir paralelkenardır.

ABCD is a square, ABLK is a paralellogram.

$m(\widehat{KLB}) = 30°$, $|AB| = 4\sqrt{3}$ cm $\Rightarrow$ **$|AK| = ?$ cm**

A) 6 B) 7 C) 8 D) 9 E) 10

**8.**



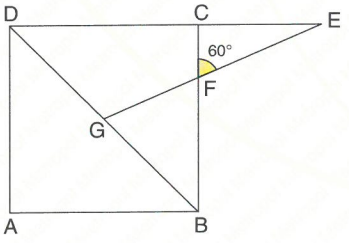

ABCD bir karedir. / ABCD is a square.

$|BK| = 3\sqrt{2}$ cm, $|AB| = 12$ cm

$\Rightarrow$ **$|CK| = |AK| = a = ?$ cm**

A) $3\sqrt{10}$ B) 9 C) $6\sqrt{2}$ D) $2\sqrt{15}$ E) $4\sqrt{3}$

**9.**



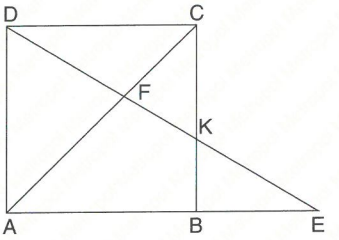

ABCD bir karedir. / ABCD is a square.

$m(\widehat{CFE}) = 60°$, $|CE| = \sqrt{3}$ br(u), $|DG| = |GB|$

$\Rightarrow$ **$|AB| = ?$ br(u)**

A) $3 + \sqrt{3}$ B) $3 + 2\sqrt{3}$ C) $6 + \sqrt{3}$ D) $6 + 2\sqrt{3}$ E) $3 + 3\sqrt{3}$

**10.**




ABCD bir karedir. / ABCD is a square.

$|AC| = |BE| \Rightarrow$ **$m(\widehat{AFE}) = ?$**

A) 112,5° B) 110° C) 107,5° D) 105° E) 102,5°

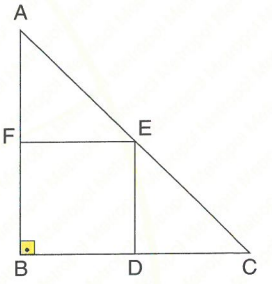
**11.** BDEF bir karedir.

BDEF is a square.

$|AB| = 4$ cm,

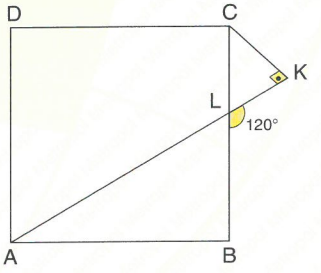
$|AC| = 2\sqrt{13}$ cm

$\Rightarrow$ **$|FE| = ?$ cm**




A) 1 B) $\frac{6}{5}$ C) $\frac{12}{5}$ D) 3 E) $\frac{16}{5}$

**12.**




ABCD bir karedir. / ABCD is a square.

$m(\widehat{KLB}) = 120°$, $[AK] \perp [CK]$, $|CL| = 4$ cm

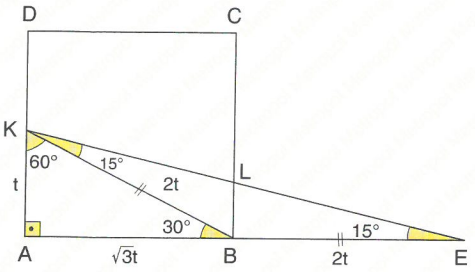
$\Rightarrow$ **Çevre / The perimeter (ABCD) = ? cm**

A) $6(\sqrt{3} + 3)$ B) $7(\sqrt{3} + 3)$ C) $8(\sqrt{3} + 3)$ D) $9(\sqrt{3} + 3)$ E) $10(\sqrt{3} + 3)$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | C | C | A | D | D | C | A | A | A | C | C |

**1.**



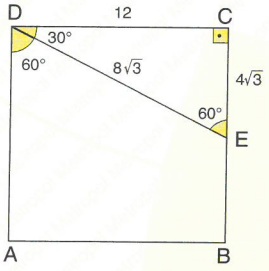

Şekilde verilenlerden aşağıdaki açı bulunur.

Given the informations in the figure, we obtain following angle.

$m(\widehat{LKB}) = 15°$

**Yanıt / Answer D**

**2.**



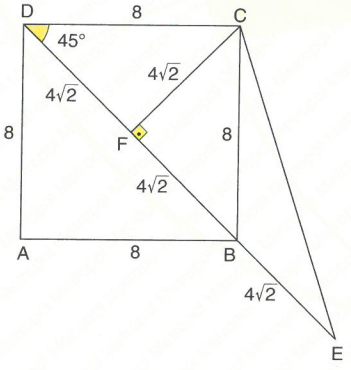

$\widehat{DCE}$ (30°, 60°, 90°)

$\Rightarrow |DC| = \frac{\sqrt{3}}{2} \cdot 8\sqrt{3} = 12\,br(u)$

Çevre / The perimeter (ABCD) = 12 · 4 = 48 br(u)

**Yanıt / Answer C**

**3.**




$[DB] \perp [CF]$

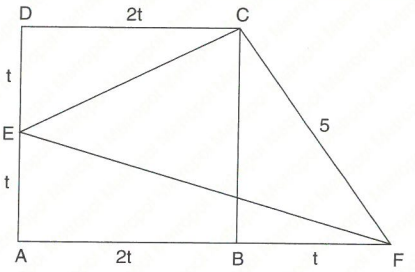
$|DF| = |FB| = |FC| = 4\sqrt{2}$ cm

$|CE|^2 = (4\sqrt{2})^2 + (8\sqrt{2})^2$ [Pythagor]

$|CE| = 4\sqrt{10}$ cm

**Yanıt / Answer C**

**4.**




$\perp \widehat{ECD} \Rightarrow$

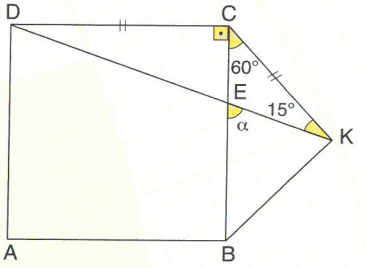
$|EC|^2 = (2t)^2 + t^2 \Rightarrow |EC| = \sqrt{5}t$ [Pythagor]

$\perp \widehat{CBF} \Rightarrow$

$|CF|^2 = (2t)^2 + t^2 \Rightarrow |CF| = \sqrt{5}t \Rightarrow |EC| = 5$ cm

**Yanıt / Answer A**

**5.**




$|DC| = |CB| = |CK|$

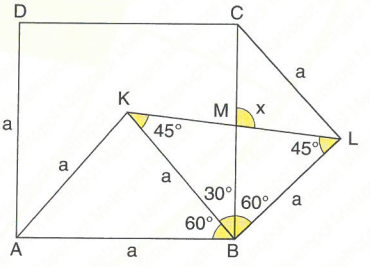
$\widehat{DCK}$ bir ikizkenardır. / DCK is a isosceles triangle.

$m(\widehat{DCK}) = 150° \Rightarrow m(\widehat{CKD}) = 15°$

$m(\widehat{KEB}) = 60° + 15° = 75°$

**Yanıt / Answer D**

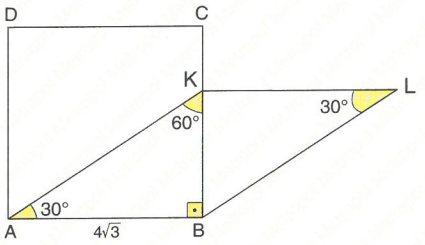
**6.**




$x = 60° + 45° \Rightarrow x = 105°$

**Yanıt / Answer D**

**7.**

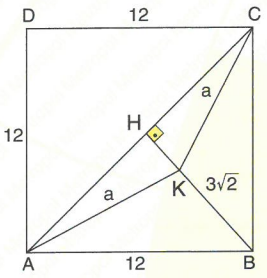



$\perp\ \widehat{BKA}\ (30°, 60°, 90°)$

$\Rightarrow |AKI = \frac{2}{\sqrt{3}}.4\sqrt{3} = 8$ cm

**Yanıt / Answer C**

**8.**



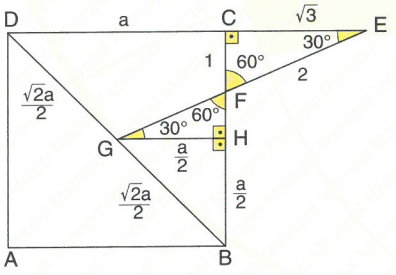

$|HKI = 3\sqrt{2}$ cm, $|HCI = 6\sqrt{2}$ cm,

$a^2 = (3\sqrt{2})^2 + (6\sqrt{2})^2$ [Pythagor]

$a^2 = 18 + 72 = 90\ cm^2 \Rightarrow a = 3\sqrt{10}$ cm

**Yanıt / Answer A**

**9.**




$|CFI = 1$ br(u) $|EFI = 2$ br(u)

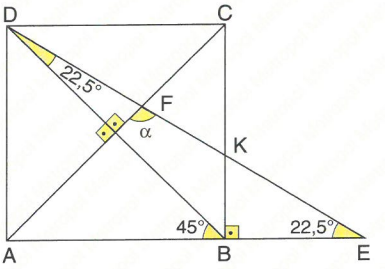
$GHF(30, 60, 90) \Rightarrow |FHI = \frac{a\sqrt{3}}{6}$

$|BCI = |ABI \Rightarrow$

$1 + \frac{a}{2} + \frac{a\sqrt{3}}{6} = a \Rightarrow a = 3 + \sqrt{3}$

**Yanıt / Answer A**

**10.**




$|ACI = |BEI = |DBI \Rightarrow m(\widehat{BDF}) = 22,5°$

$m(\widehat{AFE}) = 90° + 22,5° = 112,5°$

**Yanıt / Answer A**

**11.**

$|ACI = 2\sqrt{13}$ cm

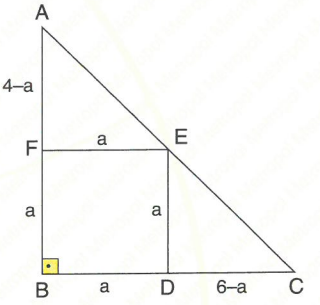
$|BCI = 6$ cm

$|DCI = 6 - a$

$\widehat{AFE} \sim \widehat{ABC}$

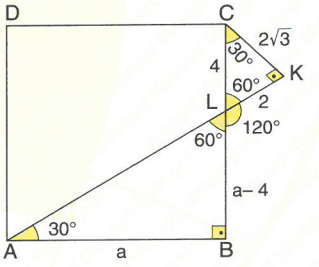
$\frac{4-a}{4} = \frac{a}{6}$

$a = \frac{12}{5}$ cm




**Yanıt / Answer C**

**12.**




**Çözüm / Solution I:**

$a = \sqrt{3}(a-4)$

$a = \frac{4\sqrt{3}}{\sqrt{3}-1} = 2\sqrt{3}(\sqrt{3}+1)$ cm

**Çevre / The perimeter (ABCD)** $= 8(\sqrt{3}+3)$ cm

**Çözüm / Solution II:**

$\widehat{CKL} \sim \widehat{ABL} \Rightarrow \frac{2\sqrt{3}}{a} = \frac{2}{a-4}$

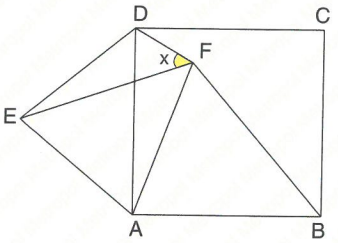
$2a = 2\sqrt{3}a - 8\sqrt{3} \Rightarrow 8\sqrt{3} = (2\sqrt{3}-2)a$

$a = \frac{8\sqrt{3}}{2\sqrt{3}-2} \Rightarrow a = 2\sqrt{3}(\sqrt{3}+1)$

Çevre / The perimeter (ABCD) $= 8(\sqrt{3}+3)$ cm

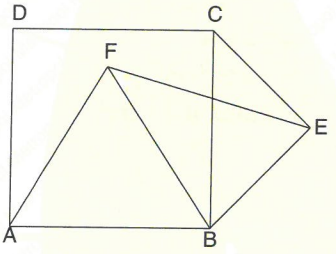
**Yanıt / Answer C**

**1.** ABCD bir kare, FAB ve EDA birer eşkenar üçgendir.
ABCD is a square, FAB and EDA are equilateral triangles.
$\Rightarrow$ **$m(\widehat{DFE}) = x = ?$**



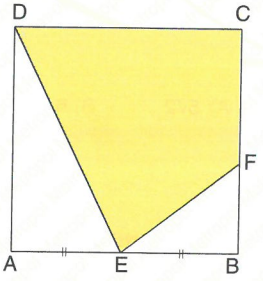

A) 15 B) 20 C) 30 D) 42 E) 45

**2.** ABCD bir kare, FAB ve EBC birer eşkenar üçgendir.
ABCD is a square, FAB and EBC are equilateral triangles.
$|EF| = 8\sqrt{2}$ cm
$\Rightarrow$ **$A(ABCD) = ?\ cm^2$**



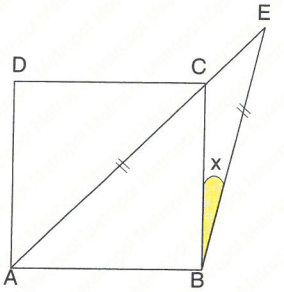

A) 128 B) 108 C) 96 D) 72 E) 64

**3.** ABCD bir karedir.
ABCD is a square.
$|AE| = |EB|$,
$5|BF| = 3|FC|$,
$A(DEFC) = 168\ cm^2$
$\Rightarrow$ **$A(ABCD) = ?\ cm^2$**



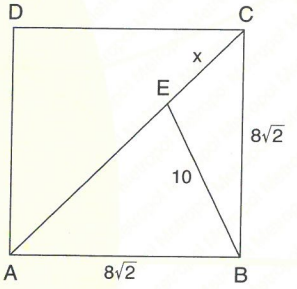

A) 324 B) 256 C) 225 D) 196 E) 192

**4.** ABCD bir karedir.
ABCD is a square.
$|AC| = |BE|$
$\Rightarrow$ **$m(\widehat{CBE}) = x = ?$**




A) 30° B) 22,5° C) 20° D) 15° E) 12,5°

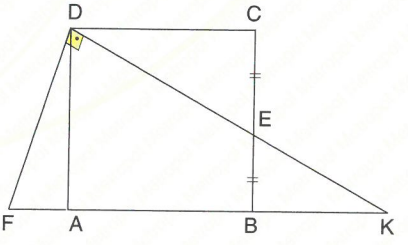
**5.**




ABCD bir karedir. / ABCD is a square.
$|AB| = 8\sqrt{2}$ cm, $|EB| = 10$ cm $\Rightarrow$ **$|EC| = x = ?$ cm**

A) 1 B) 2 C) 3 D) 4 E) 5

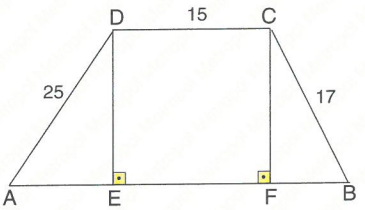
**6.**




ABCD bir karedir. / ABCD is a square.
$[FD] \perp [DK]$, $|CE| = |EB|$, $A(\widehat{FDK}) = 45\ cm^2$
$\Rightarrow$ **$A(ABCD) = ?\ cm^2$**

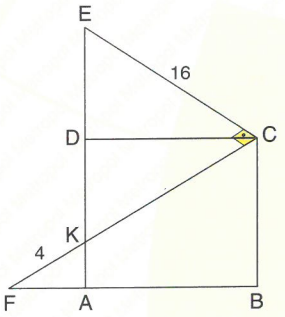
A) 16 B) 20 C) 24 D) 30 E) 36

**7.** [DC] // [AB],
DCFE bir karedir.
DCFE is a square.
|DC| = 15 cm,
|AD| = 25 cm,
|CB| = 17 cm
⇒ **A(ABCD) = ? cm²**




A) 435 B) 400 C) 385 D) 320 E) 305

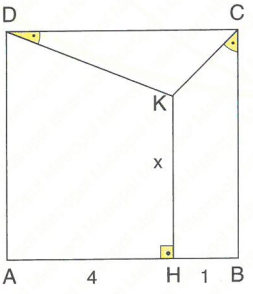
**8.**




ABCD bir karedir. / ABCD is a square.
[CK ∩ [BA = {F}, [EC] ⊥ [CF],
|EC| = 16 cm, |FK| = 4 cm
⇒ **Çevre / The perimeter (ABCD) =?**

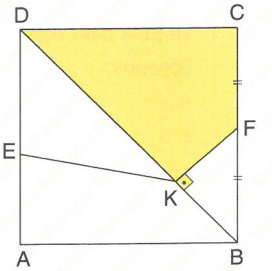
A) 32 B) 34,6 C) 36 D) 38,4 E) 40

**9.** ABCD bir karedir.
ABCD is square.
|AH| = 4 cm,
|HB| = 1 cm
⇒ **|KH| = x = ? cm**



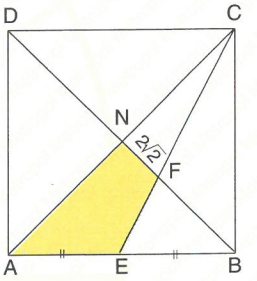

A) 1 B) 2 C) 3 D) 4 E) $\frac{9}{2}$

**10.** ABCD bir karedir.
ABCD is a square.
|BF| = |FC|,
3·|AE| = 2·|DE|,
[FK] ⊥ [BD],
A($\widehat{DEK}$) = 18 cm²
⇒ **A(DKFC) = ? cm²**



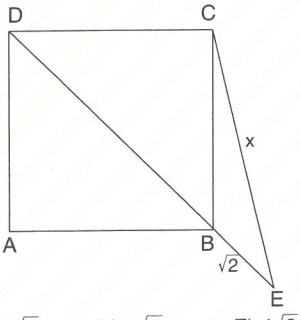

A) 43,25 B) 37,75 C) 35 D) 32,75 E) 30

**11.** ABCD bir karedir.
ABCD is a square.
|AE| = |EB|
|NF| = $2\sqrt{2}$ cm
⇒ **A(AEFN) = ? cm²**




A) 12 B) 18 C) 24 D) 36 E) 48

**12.** ABCD bir karedir.
ABCD is a square.
A(ABCD) = 36 cm²,
|BE| = $\sqrt{2}$ cm
⇒ **|CE| = x = ? cm**

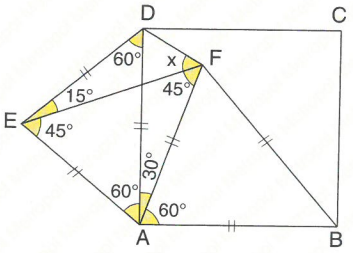



A) $5\sqrt{2}$ B) 6 C) $3\sqrt{5}$ D) $7\sqrt{2}$ E) $4\sqrt{6}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | E | B | D | B | E | A | D | C | C | C | A |

**1.**



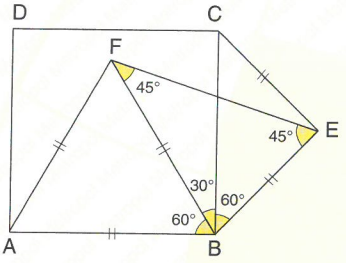

$|AD| = |AF| \Rightarrow m(\widehat{DFA}) = \dfrac{180° - 30°}{2} = 75°$

$|AE| = |AF| \Rightarrow m(\widehat{AEF}) = m(\widehat{EFA}) = 45°$

$\Rightarrow x = 75° - 45° = 30°$

**Yanıt / Answer C**

**2.**




Şekildeki verilerden aşağıdaki eşitlik bulunur.

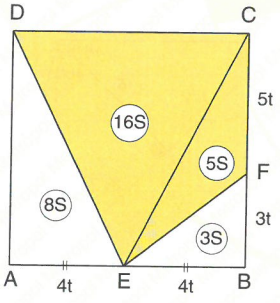
By using the angles in the figure, we obtain results.

$|EF| = 8\sqrt{2}$ cm $\Rightarrow$ $|FB| = |BE| = 8$ cm $\Rightarrow$ $a = 8$ cm

$A(ABCD) = 8^2 = 64$ cm$^2$

**Yanıt / Answer E**

**3.**

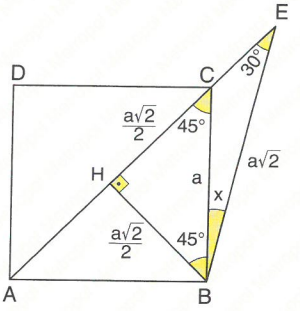



$16S + 5S = 168 \Rightarrow 21S = 168 \Rightarrow S = 8$ cm$^2$

$A(ABCD) = 32S = 32 \cdot 8 = 256$ cm$^2$

**Yanıt / Answer B**

**4.**



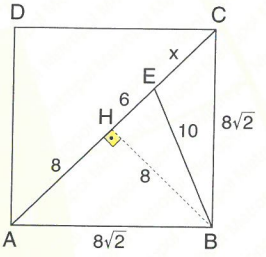

$\perp \widehat{EHB}$ (30°, 60°, 90°)

$m(\widehat{HBE}) = 60°$

$x = 60° - 45° = 15°$

**Yanıt / Answer D**

**5.**




$|AC|^2 = |AB|^2 + |BC|^2$ [ Pythagor ]

$|AC|^2 = (8\sqrt{2})^2 + (8\sqrt{2})^2 \Rightarrow |AC| = 16$ cm

$[BH] \perp [AC]$

$\Rightarrow |BH| = |AH| = |HC| = 8$ cm

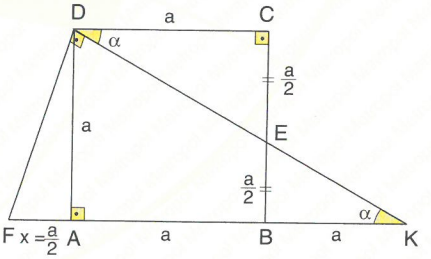
$|EH|^2 = |EB|^2 - |HB|^2$ [ Pythagor ]

$|EH|^2 = 10^2 - 8^2 = 36 \Rightarrow |EH| = 6$ cm

$x = 8 - 6 = 2$ cm

**Yanıt / Answer B**

**6.**



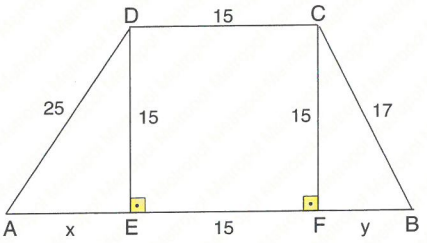

$a^2 = x \cdot 2a$ [ Euclid ] $\Rightarrow x = \dfrac{a}{2}$

$A(\widehat{FDK}) = \dfrac{a \cdot \frac{5a}{2}}{2} \Rightarrow 45 = \dfrac{5a^2}{4} \Rightarrow a^2 = 36$

$A(ABCD) = a^2 = 36$ cm$^2$

**Yanıt / Answer E**

**7.**




$x^2 = 25^2 - 15^2$ [Pythagor]

$x = 20$ cm

$y^2 = 17^2 - 15^2 \Rightarrow y = 8$ cm

$A(ABCA) = 15^2 + \frac{20 \cdot 15}{2} + \frac{15 \cdot 8}{2} = 435 \text{ cm}^2$

**Yanıt / Answer A**

**8.**

$\widehat{CDE} \sim \widehat{KFA}$

$\Rightarrow \frac{|AK|}{|DC|} = \frac{|FK|}{|EC|} = \frac{4}{16}$

$|AK| = m \Rightarrow |DC| = 4m$

$|DC| = |DA| = 4m$

$|DK| = 3m$

$\widehat{CDK} \sim \widehat{FAK}$

$\Rightarrow \frac{|KA|}{|DK|} = \frac{|FK|}{|KC|} = \frac{1}{3}$

$|FK| = 4$ cm $\Rightarrow |KC| = 12$ cm

$\perp \widehat{DCK} \Rightarrow$

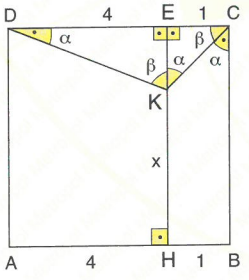
$(3m)^2 + (4m)^2 = 12^2$ [Pythagor]

$m = \frac{12}{5}$

Çevre / The perimeter $(ABCD) = 16 \cdot m = 16 \cdot \frac{12}{5} = 38{,}4$ cm

**Yanıt / Answer D**

**9.**



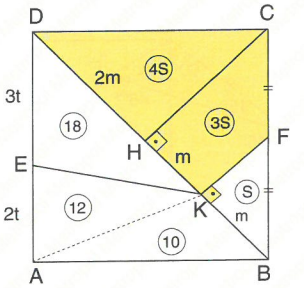

$\alpha + \beta = 90°$

$|EK|^2 = 4 \cdot 1$ [Euclid]

$|EK| = 2$ cm $\Rightarrow x = 5 - 2 = 3$ cm

**Yanıt / Answer C**

**10.**




$\left.\begin{array}{l}[CH] \perp [DB] \\ |DH| = 2 \cdot |HK| = |KB|\end{array}\right\} \Rightarrow \widehat{BKF} \sim \widehat{BHC}$

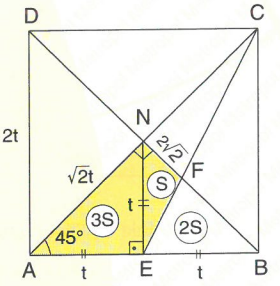
$A(\widehat{KBF}) = S \Rightarrow A(CHKF) = 3S,\ A(\widehat{DHC}) = 4S$

$A(\widehat{BDC}) = 8S = 40 \text{ cm}^2 \Rightarrow S = 5 \text{ cm}^2$

$A(DKFC) = 7S = 7 \cdot 5 = 35 \text{ cm}^2$

**Yanıt / Answer C**

**11.**



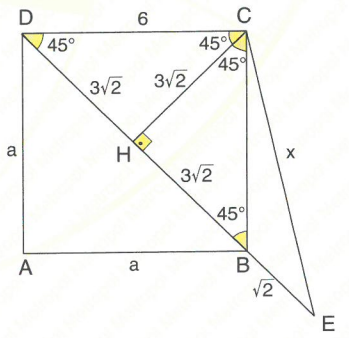

$|FB| = 2 \cdot |NF| = 4\sqrt{2} \Rightarrow |NB| = 6\sqrt{2} \Rightarrow t = 6$ cm

$3S = \frac{6 \cdot 6}{2} = 18 \text{ cm}^2 \Rightarrow S = 6 \text{ cm}^2$

$\Rightarrow A(AEFN) = 4S = 4 \cdot 6 = 24 \text{ cm}^2$

**Yanıt / Answer C**

**12.**




$A(ABCD) = a^2 \Rightarrow a^2 = 36 \Rightarrow a = 6$ cm

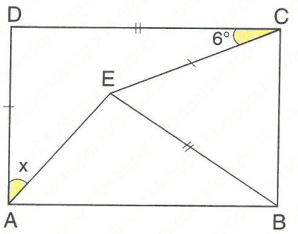
$[CH] \perp [DE] \Rightarrow |CH| = |DH| = |HB| = 3\sqrt{2}$ cm

$x^2 = (3\sqrt{2})^2 + (4\sqrt{2})^2$ [Pythagor]

$x^2 = 18 + 32 \Rightarrow x = 5\sqrt{2}$ cm

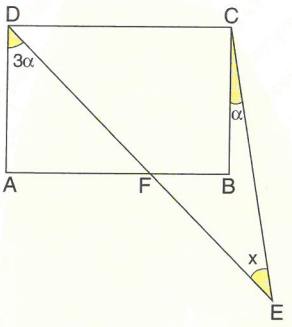
**Yanıt / Answer A**

**1.** ABCD bir dikdörtgendir.
ABCD is a rectangle.
IADI = ICEI,
IDCI = IEBI,
$m(\widehat{DCE}) = 6°$
$\Rightarrow$ **$m(\widehat{DAE}) = x = ?$**



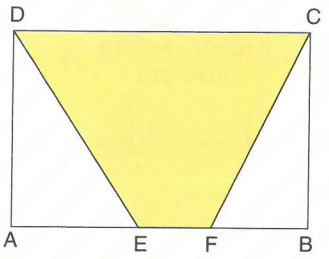

A) 11° B) 21° C) 24° D) 26° E) 27°

**2.** ABCD bir dikdörtgendir.
ABCD is a rectangle.
$m(\widehat{ADE}) = 3 \cdot m(\widehat{ECB}) = 3\alpha$
$\Rightarrow$ **$m(\widehat{CED}) = x = ?$**



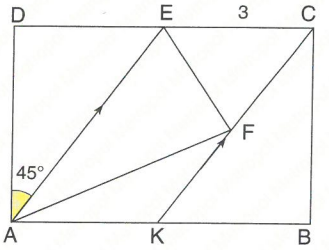

A) α B) 2α C) 3α D) 4α E) 5α

**3.** ABCD bir dikdörtgendir.
ABCD is a rectangle.
2IEFI = 2IFBI = IAEI,
A(ABCD) = 144 $cm^2$.
$\Rightarrow$ **A(EFCD) = ? $cm^2$**




A) 70 B) 72 C) 88 D) 90 E) 96

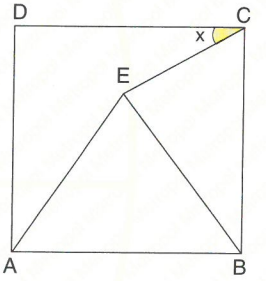
**4.**




ABCD bir dikdörtgendir. / ABCD is a rectangle.
[EA] // [CK], $m(\widehat{EAD}) = 45°$, IECI = 3 cm
$A(\widehat{EFA}) = 12\ cm^2 \Rightarrow$ **A(ABCD) = ? $cm^2$**

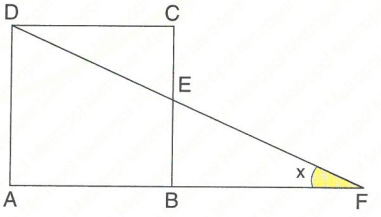
A) 36 B) 48 C) 60 D) 72 E) 88

**5.** ABCD kare, EAB bir eşkenar üçgendir.
ABCD is square,
EAB is an equilateral triangle.
$\Rightarrow$ **m(DCE) = x = ?**




A) 15° B) 25° C) 30° D) 35° E) 40°

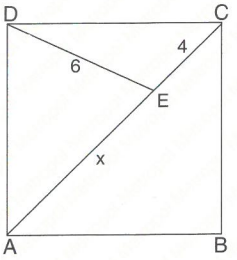
**6.**




ABCD bir karedir. / ABCD is a square.
IBFI = $\sqrt{2}$·IABI $\Rightarrow$ **$m(\widehat{DFA}) = x = ?$**

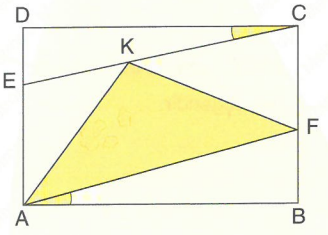
A) 17,5° B) 22,5° C) 35,5° D) 42,5° E) 44,5°

**7.** ABCD bir karedir.
ABCD is a square.
IDEI = 6 cm,
ICEI = 4 cm
⇒ **IAEI = x = ? cm**



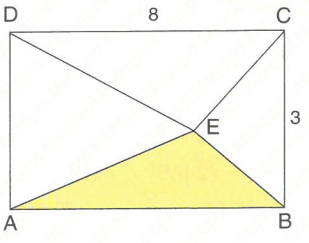

A) $\sqrt{14}$ B) $2\sqrt{14}$ C) $3\sqrt{14}$ D) $4\sqrt{14}$ E) $5\sqrt{14}$

**8.** ABCD bir dikdörtgendir.
ABCD is a rectangle.
$m(\widehat{DCE}) = m(\widehat{FAB})$
3·IDEI = IEAI,
A(ABCD) = 48 $cm^2$
⇒ **$A(\widehat{KAF})$ = ? $cm^2$**



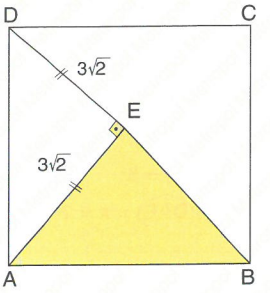

A) 18 B) 24 C) 30 D) 36 E) 42

**9.** ABCD bir dikdörtgendir.
ABCD is a rectangle.
IDCI = 8 cm,
ICBI = 3 cm,
$A(\widehat{DCE})$ = 5 $cm^2$
⇒ **$A(\widehat{AEB})$ = ? $cm^2$**



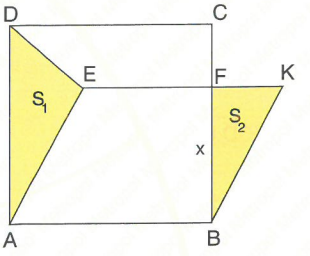

A) 3 B) 4 C) 5 D) 6 E) 7

**10.** ABCD bir karedir.
ABCD is a square.
[DE] ⊥ [EA],
IDEI = IAEI = $3\sqrt{2}$ cm
⇒ **$A(\widehat{AEB})$ = ? $cm^2$**



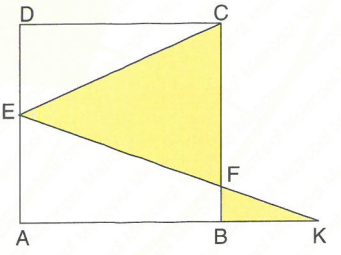

A) 3 B) 6 C) 9 D) 12 E) 18

**11.** ABCD bir kare, ABKE bir paralelkenardır.
ABCD is a square,
ABKE is a parallelogram.
$A(\widehat{ADE}) = S_1$ $cm^2$,
$A(\widehat{KBF}) = S_2$ $cm^2$
$\frac{S_1}{S_2} = \frac{4}{3}$,
IDCI = 12 cm ⇒ **IFBI = x = ? cm**




A) 3 B) 6 C) 8 D) 9 E) 10

**12.**




ABCD bir karedir. / ABCD is a square.
4·IBKI = IABI, 3·IEAI = 5·IDEI

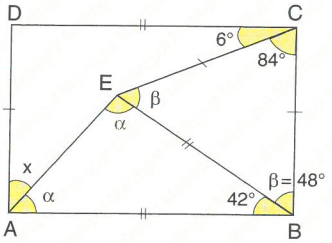
$$\Rightarrow \frac{A(\widehat{EFC}) + A(\widehat{FBK})}{A(ABCD)} = ?$$

A) $\frac{21}{64}$ B) $\frac{25}{64}$ C) $\frac{27}{64}$ D) $\frac{29}{64}$ E) $\frac{33}{64}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | B | D | E | A | B | B | A | E | C | D | D |

**1.**



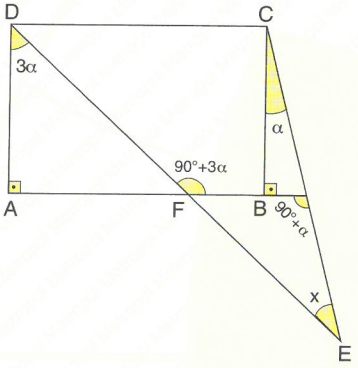

$2\beta = 96° \Rightarrow \beta = 48°$

$2\alpha = 138° \Rightarrow \alpha = 69°$

$x = 90° - 69° = 21°$

**Yanıt / Answer B**

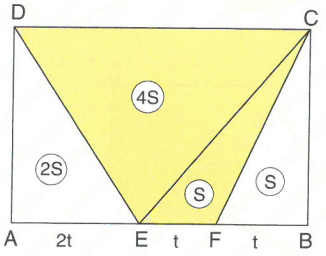
**2.**




$3\alpha + 90° = 90° + \alpha + x \Rightarrow x = 2\alpha$

**Yanıt / Answer B**

**3.**

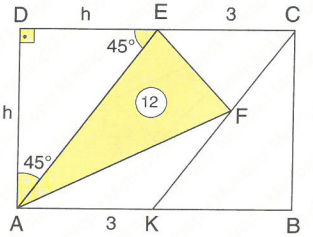



$A(ABCD) = 8S \Rightarrow 8S = 144 \Rightarrow S = 18\ cm^2$

$\Rightarrow A(EFCD) = 5 \cdot S = 18 \cdot 5 = 90\ cm^2$

**Yanıt / Answer D**

**4.**



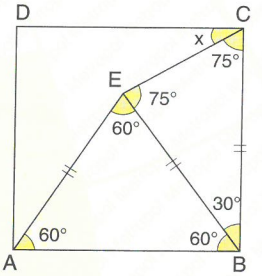

$A(\widehat{AEF}) = 12\ cm^2 \Rightarrow A(AKCE) = 24\ cm^2$

$3 \cdot h = 24 \Rightarrow h = 8\ cm$

$\left.\begin{array}{l} |DC| = 11\ cm \\ |AD| = 8\ cm \end{array}\right\} \Rightarrow A(ABCD) = 88\ cm^2$

**Yanıt / Answer E**

**5.**

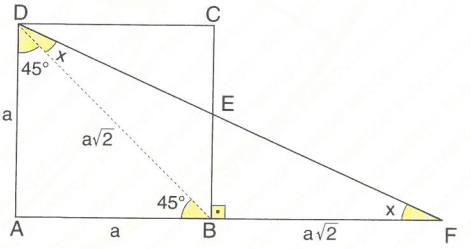



$m(\widehat{CEB}) = m(\widehat{ECB}) = \dfrac{180° - 30°}{2} = 75°$

$x = 90° - 75° \Rightarrow x = 15°$

**Yanıt / Answer A**

**6.**




$\perp \widehat{DAB}\ (45°, 45°, 90°) \Rightarrow$

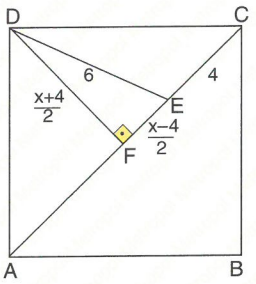
$|DA| = |AB| = a\ cm \Rightarrow |DB| = a\sqrt{2}\ cm$

$|DB| = |BF| \Rightarrow 2x = 45°$

$x = 22{,}5°$

**Yanıt / Answer B**

**7.**




$|DF| = \frac{x+4}{2}$, $|FE| = \frac{x-4}{2}$

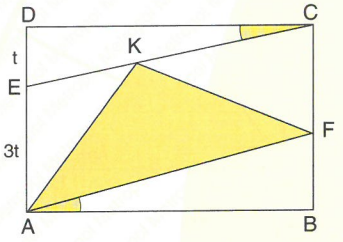
$\left(\frac{x+4}{2}\right)^2 + \left(\frac{x-4}{2}\right)^2 = 6^2 \Rightarrow \frac{x^2}{2} + \frac{4^2}{2} = 36$

$\Rightarrow x^2 = 56$

$\Rightarrow x = 2\sqrt{14}$ cm

**Yanıt / Answer B**

**8.**

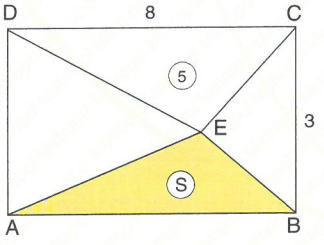



$A(AFCE) = \frac{3 \cdot A(ABCD)}{4} = 36 \text{ cm}^2$

$A(\widehat{KAF}) = 18 \text{ cm}^2$

**Yanıt / Answer A**

**9.**

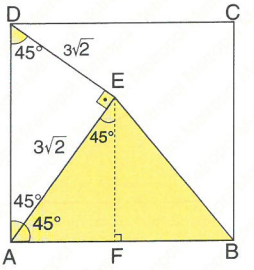



$A(ABCD) = 24 \text{ cm}^2 \Rightarrow S + 5 = \frac{24}{2} = 12$

$\Rightarrow S = 7 \text{ cm}^2$

**Yanıt / Answer E**

**10.**




$|AD| = |EA| \cdot \sqrt{2}$

$|AD| = 3\sqrt{2} \cdot \sqrt{2} = 6$ cm

$|AB| = |AD| = 6$ cm

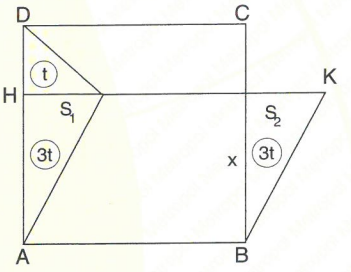
$|EF| = |EA| \cdot \frac{1}{\sqrt{2}}$

$|EF| = 3\sqrt{2} \cdot \frac{1}{\sqrt{2}} = 3$ cm

$A(\widehat{AEB}) = \frac{3 \cdot 6}{2} = 9 \text{ cm}^2$

**Yanıt / Answer C**

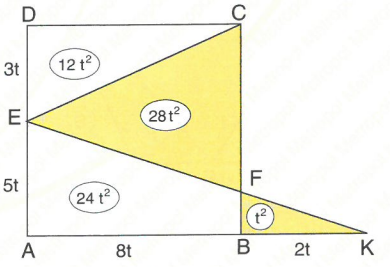
**11.**




$\frac{S_1}{S_2} = \frac{4}{3} = \frac{4t}{3t} \Rightarrow x = \frac{3 \cdot 12}{4} = 9$ cm

**Yanıt / Answer D**

**12.**

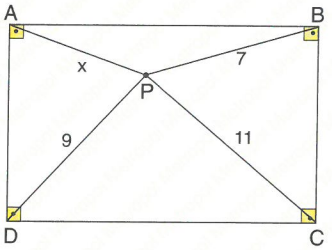



$\frac{|BK|}{|KA|} = \frac{|FB|}{|EA|} \Rightarrow \frac{2t}{10t} = \frac{|FB|}{5t} \Rightarrow |FB| = t$ cm

$\frac{A(\widehat{EFC}) + A(\widehat{FBK})}{A(ABCD)} = \frac{28t^2 + t^2}{64t^2} = \frac{29}{64}$

**Yanıt / Answer D**

**1.**



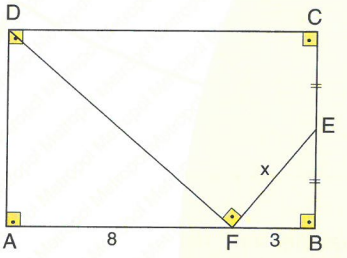

ABCD bir dikdörtgendir. / ABCD is a rectangle.

IPBI = 7 cm, IDPI = 9 cm, ICPI = 11 cm

⇒ **IAPI = x = ? cm**

A) $\sqrt{3}$ B) $\sqrt{5}$ C) 3 D) 5 E) 6

**2.**



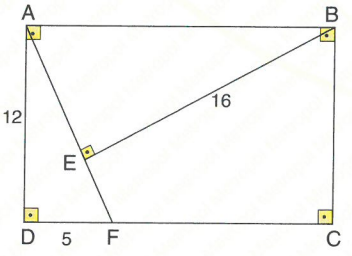

ABCD bir dikdörtgendir. / ABCD is a rectangle.

ICEI = IEBI, [AF] ⊥ [EF], IAFI = 8 cm, IFBI = 3 cm

⇒ **IEFI = x = ? cm**

A) $2\sqrt{3}$ B) $3\sqrt{3}$ C) $2\sqrt{5}$ D) $3\sqrt{5}$ E) $\sqrt{21}$

**3.**

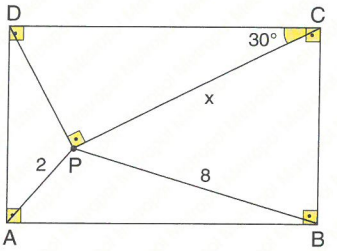



ABCD bir dikdörtgendir. / ABCD is a rectangle.

[BE] ⊥ [AF], IBEI = 16 cm ⇒ **A(ABCD) = ? cm²**

A) 172 B) 188 C) 196 D) 208 E) 216

**4.**



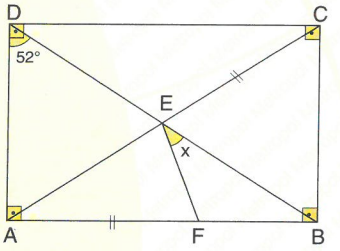

ABCD bir dikdörtgendir. / ABCD is a rectangle.

[DP] ⊥ [CP], IAPI = 2 cm, IPBI = 8 cm

⇒ **IPCI = x = ? cm**

A) $3\sqrt{5}$ B) $4\sqrt{3}$ C) $5\sqrt{3}$ D) $3\sqrt{10}$ E) $4\sqrt{10}$

**5.**

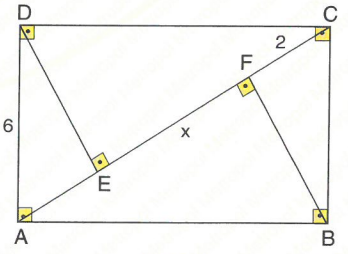



ABCD bir dikdörtgendir. / ABCD is a rectangle.

ICEI = IAFI, m($\widehat{EDA}$) = 52° ⇒ **m($\widehat{FEB}$) = x = ?**

A) 30 B) 32 C) 33 D) 35 E) 38

**6.**



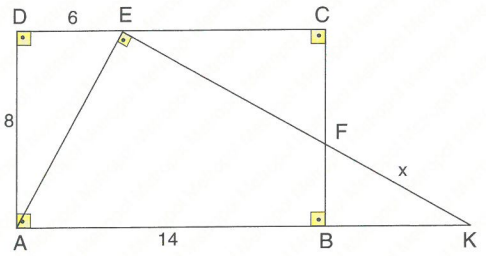

ABCD bir dikdörtgendir. / ABCD is a rectangle.

[BF] ⊥ [CA], [DE] ⊥ [AC], IDAI = 6 cm, ICFI = 2 cm

⇒ **IEFI = x = ? cm**

A) 6 B) 8 C) 10 D) 12 E) 14

**7.**



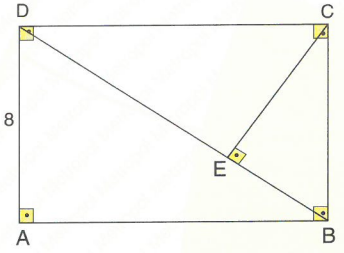

ABCD bir dikdörtgendir. / ABCD is a rectangle.

[AE] ⊥ [EK], |AD| = 8 cm, |DE| = 6 cm, |AB| = 14 cm

⇒ **|FK| = x = ? cm**

A) $\frac{8}{3}$ B) $\frac{10}{3}$ C) $\frac{11}{3}$ D) $\frac{15}{3}$ E) $\frac{17}{3}$

**8.**



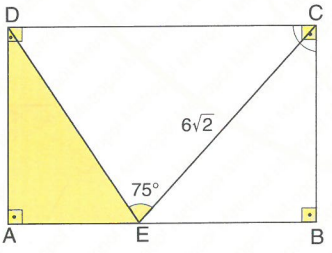

ABCD bir dikdörtgendir. / ABCD is a rectangle.

[CE] ⊥ [DB], 3·|EB| = |DE|, |AD| = 8 cm

⇒ **A(ABCD) = ? cm²**

A) $36\sqrt{3}$ B) $48\sqrt{3}$ C) $56\sqrt{3}$ D) $64\sqrt{3}$ E) $72\sqrt{3}$

**9.**



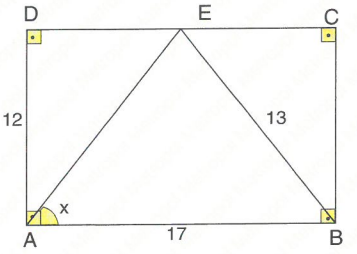

ABCD bir dikdörtgendir. / ABCD is a rectangle.

$m(\widehat{DCE}) = m(\widehat{ECB})$ , $m(\widehat{CED}) = 75°$, |CE| = $6\sqrt{2}$ cm

⇒ **$A(\widehat{AED})$ = ? cm²**

A) $6\sqrt{3}$ B) $8\sqrt{3}$ C) $10\sqrt{2}$ D) $12\sqrt{2}$ E) $18\sqrt{2}$

**10.**



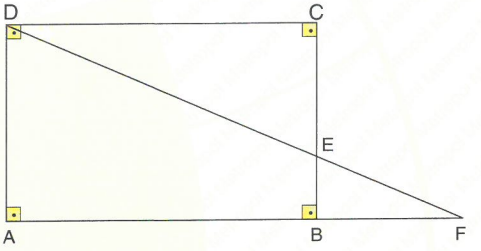

ABCD bir dikdörtgendir. / ABCD is a rectangle.

|AD| = 12 cm, |EB| = 13 cm, |AB| = 17 cm

⇒ **$m(\widehat{EAB})$ = x = ?**

A) 30 B) 45 C) 60 D) 75 E) 80

**11.**

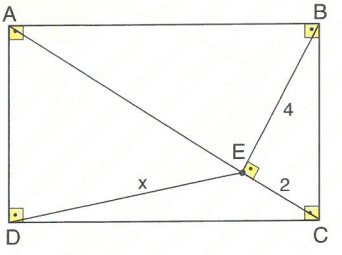



ABCD bir dikdörtgendir. / ABCD is a rectangle.

2·|BE| = |CE|, $A(\widehat{BFE})$ = 6 cm² ⇒ **A(ABCD) = ? cm²**

A) 36 B) 38 C) 54 D) 64 E) 72

**12.**




ABCD bir dikdörtgendir. / ABCD is a rectangle.

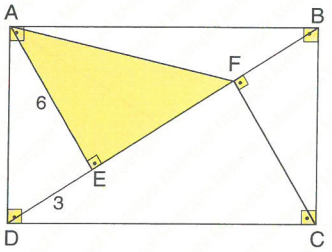
[CE] ⊥ [EB], |EB| = 4 cm, |CE| = 2 cm ⇒ **|ED| = ? cm**

A) $\sqrt{31}$ B) $\sqrt{15}$ C) $\sqrt{21}$ D) $2\sqrt{13}$ E) $2\sqrt{15}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | E | D | D | C | E | B | D | A | B | E | D |

**1.**



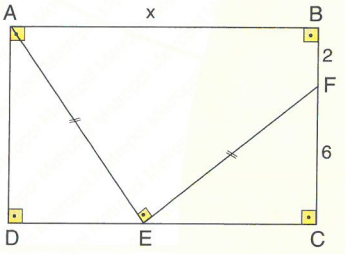

ABCD bir dikdörtgendir. / ABCD is a rectangle.

[FC] ⊥ [BD], [DE] ⊥ [AE], IDEI = 3 cm, IAEI = 6 cm

⇒ **A($\widehat{EFA}$) = ? cm²**

A) 9 B) 12 C) 18 D) 27 E) 36

**2.**



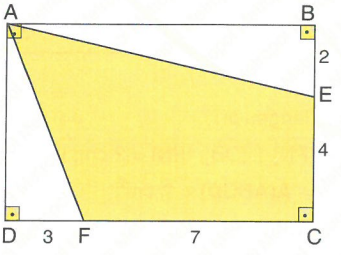

ABCD bir dikdörtgendir. / ABCD is a rectangle.

IAEI = IEFI, IFCI = 6 cm, IBFI = 2 cm, [AE] ⊥ [EF],

⇒ **IABI = x = ? cm**

A) 10 B) 11 C) 12 D) 13 E) 14

**3.**



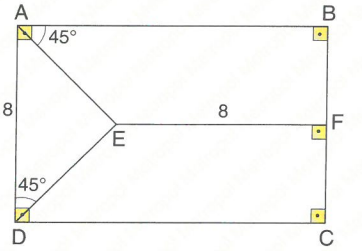

ABCD bir dikdörtgendir. / ABCD is a rectangle.

IDFI = 3 cm, IFCI = 7 cm, ICEI = 4 cm, IEBI = 2 cm

⇒ **A(AFCE) = ? cm²**

A) 37 B) 41 C) 45 D) 48 E) 51

**4.**



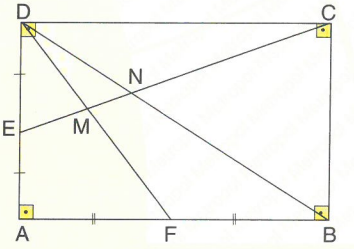

ABCD bir dikdörtgendir. / ABCD is a rectangle.

m($\widehat{BAE}$) = m($\widehat{EDA}$) = 45°, [EF] ⊥ [CB],

IEFI = IDAI = 8 cm ⇒ **A(ABCD) = ? cm²**

A) 64 B) 72 C) 80 D) 96 E) 108

**5.**




ABCD bir dikdörtgendir. / ABCD is a rectangle.

IDEI = IEAI, IAFI = IFBI ⇒ $\frac{\text{IMNI}}{\text{ICNI}}$ = ?

A) $\frac{1}{3}$ B) $\frac{1}{4}$ C) $\frac{1}{5}$ D) $\frac{1}{6}$ E) $\frac{1}{8}$

**6.** ABCD bir dikdörtgendir.

ABCD is a rectangle.

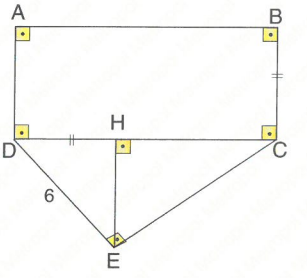
[EH] ⊥ [DC],

[DE] ⊥ [EC],

IDHI = IBCI,

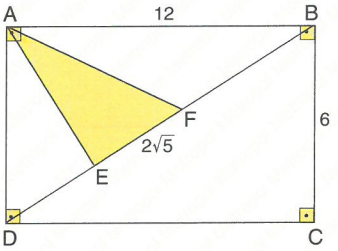
IDEI = 6 cm

⇒ **A(ABCD) = ? cm²**




A) 36 B) 48 C) 54 D) 64 E) 72

**7.**



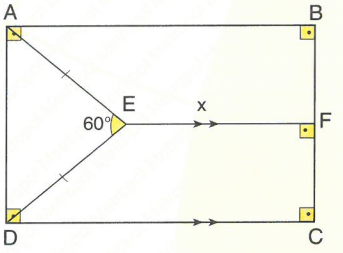

ABCD bir dikdörtgendir. / ABCD is a rectangle.

$|AB| = 12$ cm, $|BC| = 6$ cm, $|EF| = 2\sqrt{5}$ cm

$\Rightarrow$ **$A(\widehat{AEF}) = ?$ cm$^2$**

A) 12 B) 14 C) 16 D) 18 E) 20

**8.**




ABCD bir dikdörtgendir. / ABCD is a rectangle.

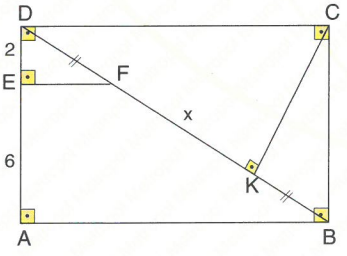
[EF] // [AB], $|DE| = |AE|$, $m(\widehat{DEA}) = 60°$,

$A(ABCD) = 60\sqrt{3}$, cm$^2$ $A(\widehat{AED}) = 9\sqrt{3}$ cm$^2$

$\Rightarrow$ **$|EF| = x = ?$ cm**

A) 6 B) 7 C) 8 D) $6\sqrt{3}$ E) $7\sqrt{3}$

**9.**



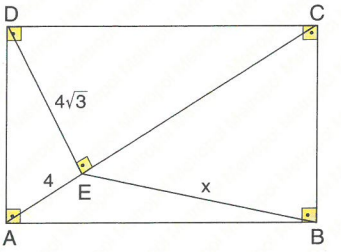

ABCD bir dikdörtgendir. / ABCD is a rectangle.

[FE] $\perp$ [DA], [CK] $\perp$ [DB], $|DF| = |KB|$, $|DE| = 2$ cm,

$|EA| = 6$ cm $\Rightarrow$ **$|FK| = x = ?$ cm**

A) 6 B) 7 C) 8 D) 9 E) 12

**10.**



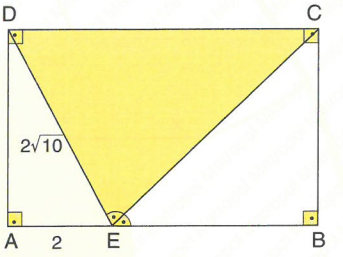

ABCD bir dikdörtgendir. / ABCD is a rectangle.

[DE] $\perp$ [AC], $|DE| = 4\sqrt{3}$ cm, $|AE| = 4$ cm

$\Rightarrow$ **$|EB| = x = ?$ cm**

A) $6\sqrt{3}$ B) 12 C) $8\sqrt{3}$ D) $4\sqrt{7}$ E) $5\sqrt{6}$

**11.**



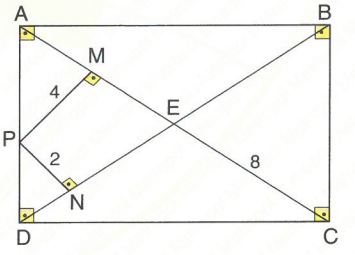

ABCD bir dikdörtgendir. / ABCD is a rectangle.

$m(\widehat{DEC}) = m(\widehat{CEB})$, $|DE| = 2\sqrt{10}$ cm, $|AE| = 2$ cm

$\Rightarrow$ **$A(\widehat{DEC}) = ?$ cm$^2$**

A) $10\sqrt{5}$ B) $6\sqrt{10}$ C) $15\sqrt{5}$ D) 40 E) $20\sqrt{5}$

**12.**




ABCD bir dikdörtgendir. / ABCD is a rectangle.

[PM] $\perp$ [AC], [PN] $\perp$ [DB], $|PN| = 2$ cm, $|PM| = 4$ cm

$|EC| = 8$ cm $\Rightarrow$ **$A(ABCD) = ?$ cm$^2$**

A) 48 B) 60 C) 72 D) 84 E) 96

**YANITLAR / ANSWERS**

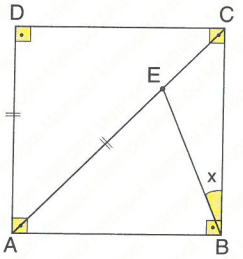
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E | B | D | C | A | A | E | C | D | B | E |

**1.** ABCD bir karedir.

ABCD is a square.

$|AD| = |AE|$

$\Rightarrow$ **$m(\widehat{EBC}) = x = ?$**




A) 15° B) 20° C) 22,5° D) 30° E) 37,5°

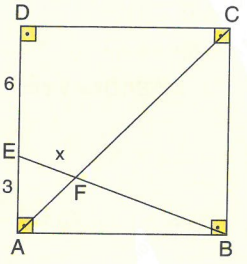
**2.** ABCD bir karedir.

ABCD is a square.

$|AE| = 3$ cm,

$|DE| = 6$ cm

$\Rightarrow$ **$|EF| = x = ?$ cm**




A) $\frac{\sqrt{10}}{4}$ B) $\frac{\sqrt{10}}{2}$ C) $\frac{\sqrt{15}}{4}$ D) $\frac{\sqrt{15}}{2}$ E) $\frac{3\sqrt{10}}{4}$

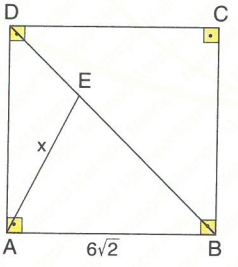
**3.** ABCD bir karedir.

ABCD is a square.

$|AB| = 6\sqrt{2}$ cm,

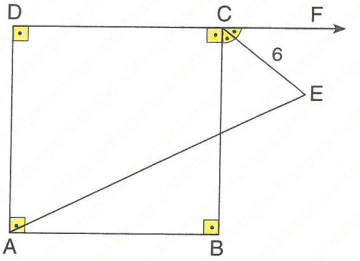
$3 \cdot |DE| = |EB|$

$\Rightarrow$ **$|AE| = x = ?$ cm**




A) $3\sqrt{2}$ B) $3\sqrt{3}$ C) 6 D) $3\sqrt{5}$ E) $5\sqrt{5}$

**4.**




ABCD bir karedir. / ABCD is a square.

$m(\widehat{FCE}) = m(\widehat{ECB})$, $A(ABCD) = 32$ cm$^2$,

$|CE| = 6$ cm $\Rightarrow$ **$|AE| = ?$ cm**

A) $8\sqrt{2}$ B) 10 C) $10\sqrt{2}$ D) 16 E) $16\sqrt{2}$

**5.** ABCD bir karedir.

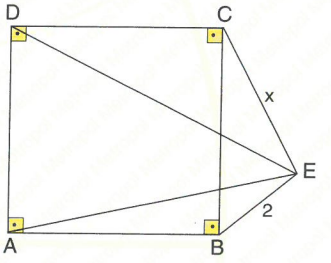
ABCD is a square.

$|BE| = 2$ cm,

$|AE| = 7$ cm,

$|DE| = 9$ cm

$\Rightarrow$ **$|EC| = ?$ cm**




A) 6 B) $6\sqrt{2}$ C) 8 D) $7\sqrt{2}$ E) 10

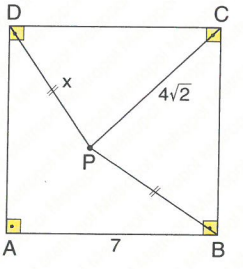
**6.** ABCD bir karedir.

ABCD is a square.

$|PC| = 4\sqrt{2}$ cm,

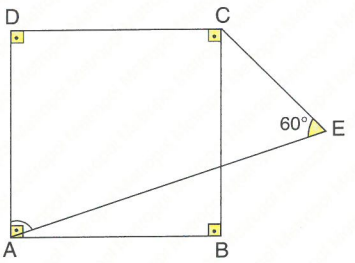
$|AB| = 7$ cm

$\Rightarrow$ **$|PD| = x = ?$ cm**




A) $2\sqrt{2}$ B) 5 C) $3\sqrt{2}$ D) 6 E) $4\sqrt{2}$

**7.**




ABCD bir karedir. / ABCD is a square.

$m(\widehat{CEA}) = 60°$, $m(\widehat{EAD}) = 75°$, $|AE| = 16$ cm

$\Rightarrow$ **A(ABCD) = ? cm²**

A) 48 B) 64 C) 96 D) 144 E) 256

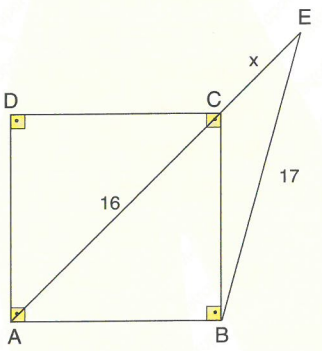
**8.** ABCD bir karedir.

ABCD is a square.

$|AC| = 16$ cm,

$|BE| = 17$ cm

$\Rightarrow$ **$|CE| = x = ?$ cm**




A) 6 B) 7 C) 8 D) 9 E) 10

**9.** ABCD bir karedir.

ABCD is a square.

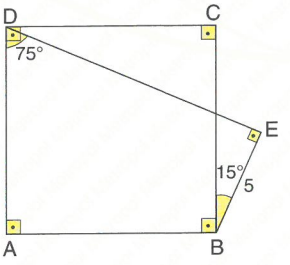
$[DE] \perp [BE]$,

$m(\widehat{EDA}) = 75°$,

$m(\widehat{EBC}) = 15°$

$|BE| = 5$ cm

$\Rightarrow$ **A(ABCD) = ? cm²**



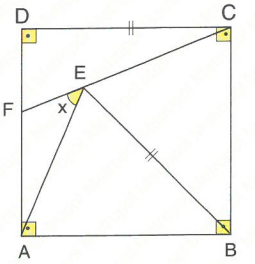

A) 25 B) 45 C) 50 D) 75 E) 100

**10.** ABCD bir karedir.

ABCD is a square.

$|DC| = |BE|$

$\Rightarrow$ **$m(\widehat{FEA}) = x = ?$**




A) 30 B) 35 C) 40 D) 45 E) 50

**11.** ABCD bir karedir.

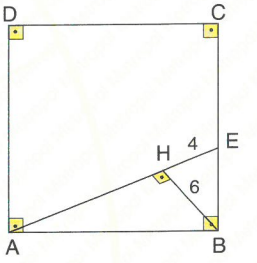
ABCD is a square.

$[BH] \perp [AE]$,

$|HB| = 6$ cm,

$|HE| = 4$ cm

$\Rightarrow$ **A(ABCD) = ? cm²**




A) 62 B) 68 C) 72 D) 86 E) 117

**12.** ABCD bir karedir.

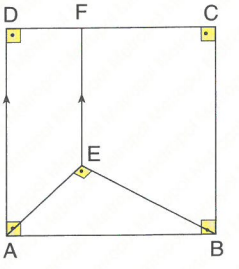
ABCD is a square.

$[AE] \perp [EB]$,

$[FE] \,//\, [AD]$,

$5 \cdot |FD| = |AD|$

$\Rightarrow$ **$\frac{|DF|}{|FE|} = ?$**




A) $\frac{2}{5}$ B) $\frac{3}{5}$ C) $\frac{1}{3}$ D) $\frac{5}{7}$ E) $\frac{9}{14}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | E | D | B | A | B | C | B | C | D | E | C |

**1.** ABCD bir karedir.

ABCD is a square.

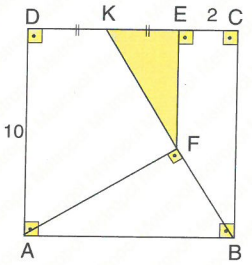
[AF] ⊥ [FB],

[CD] ⊥ [FE],

IDKI = IKEI,

IADI = 10 cm

⇒ **A($\widehat{KEF}$) = ? cm²**




A) 6 B) 8 C) 10 D) 12 E) 14

**2.** ABCD bir karedir.

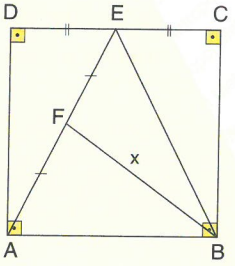
ABCD is a square.

IDEI = IECI,

IEFI = IFAI,

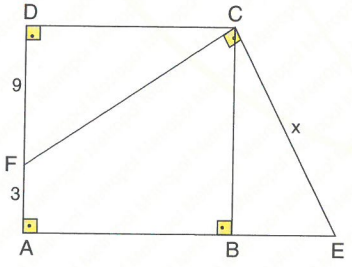
IABI = 8 cm

⇒ **IFBI = x = ? cm**




A) $\sqrt{13}$ B) $\sqrt{15}$ C) $2\sqrt{13}$ D) $2\sqrt{15}$ E) 8

**3.**




ABCD bir karedir. / ABCD is a square.

[FC] ⊥ [CE], IDFI = 9 cm, IFAI = 3 cm

⇒ **ICEI = x = ? cm**

A) 13 B) 15 C) 16 D) 18 E) 20

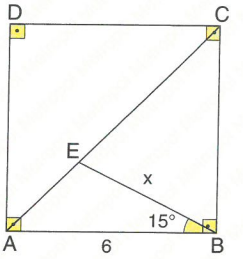
**4.** ABCD bir karedir.

ABCD is a square.

m($\widehat{ABE}$) = 15°,

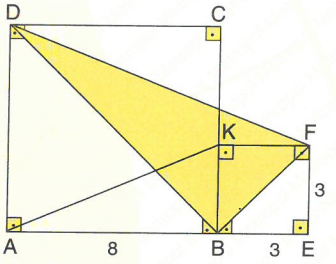
IABI = 6 cm

⇒ **IEBI = x = ? cm**




A) $2\sqrt{2}$ B) $3\sqrt{2}$ C) $2\sqrt{3}$ D) $3\sqrt{3}$ E) $2\sqrt{6}$

**5.**




ABCD ve BEFK birer karedir.

ABCD and BEFK are is squares.

IABI = 8 cm, IBEI = 3 cm ⇒ **A($\widehat{BFD}$) = ? cm²**

A) 18 B) $18\sqrt{2}$ C) 24 D) $24\sqrt{2}$ E) 36

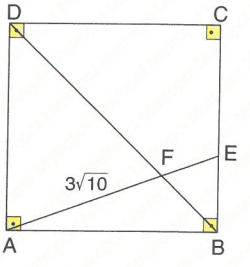
**6.** ABCD bir karedir.

ABCD is a square.

3·IFBI = IDFI,

IAFI = $3\sqrt{10}$ cm

⇒ **A(ABCD) = ? cm²**




A) 144 B) 169 C) 180 D) 196 E) 215

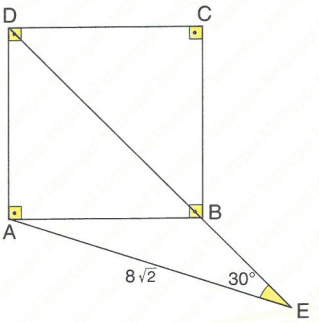
**7.** ABCD bir karedir.

ABCD is a square.

$|AE| = 8\sqrt{2}$ cm,

$m(\widehat{DEA}) = 30°$

$\Rightarrow$ **A(ABCD) = ? cm²**




A) 32 B) 36 C) 48 D) 54 E) 64

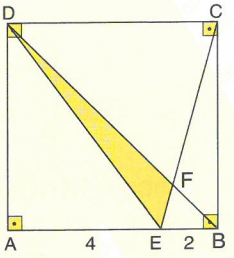
**8.** ABCD bir karedir.

ABCD is a square.

$|EB| = 2$ cm,

$|AE| = 4$ cm

$\Rightarrow$ **A($\widehat{DEF}$) = ? cm²**




A) 4 B) $\frac{9}{2}$ C) 5 D) $\frac{11}{2}$ E) 6

**9.** ABCD bir karedir.

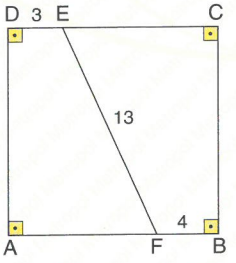
ABCD is a square.

$|DE| = 3$ cm,

$|FB| = 4$ cm,

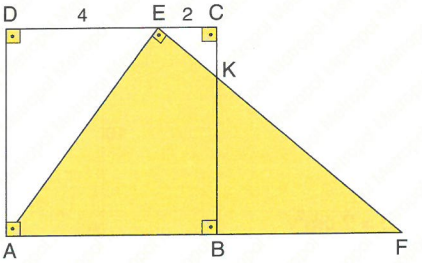
$|EF| = 13$ cm

$\Rightarrow$ **A(ABCD) = ? cm²**




A) 100 B) 121 C) 144 D) 169 E) 196

**10.**




ABCD bir karedir. / ABCD is a square.

$[AE] \perp [EF]$, $|DE| = 4$ cm, $|EC| = 2$ cm

$\Rightarrow$ **A($\widehat{AEF}$) = ? cm²**

A) 39 B) 45 C) 54 D) 63 E) 72

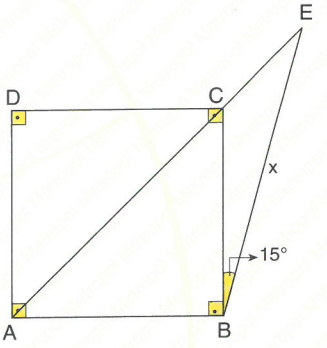
**11.** ABCD bir karedir.

ABCD is a square.

$m(\widehat{CBE}) = 15°$,

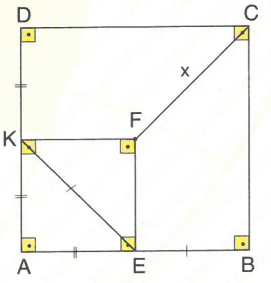
$A(ABCD) = 72$ cm²

$\Rightarrow$ **|BE| = x = ? cm**




A) $6\sqrt{3}$ B) 9 C) $9\sqrt{3}$ D) 12 E) $12\sqrt{3}$

**12.**




ABCD bir dikdörtgen ve AEFK bir karedir.

ABCD is a rectangle and AEFK is a square.

$|EK| = |EB|$, $|DK| = |KA|$, $|BC| = 6$ cm

$\Rightarrow$ **|FC| = ? cm**

A) $2\sqrt{3}$ B) $3\sqrt{3}$ C) $4\sqrt{3}$ D) $2\sqrt{5}$ E) $3\sqrt{5}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | C | B | E | C | A | E | B | C | A | D | B |

# BÖLÜM CHAPTER 10

## TARİHSEL NOT / HISTORICAL NOTE

### Grigori Yakovlevich Perelman [1966 – ]

Matematikte çözülemeyen en büyük problemlerden biri olan Poincaré sanısını çözen Rus matematikçi. St. Petersburg'daki Steklov Enstitüsü'ndeki görevinden istifa ederek kayıplara karışan Perelman'ın, psikolojik olarak zor bir dönemde olduğu matematikle ilişkisini kestiği belirtiliyordu. Perelman'ın, uzmanlar tarafından bile zor anlaşılan, Poincaré önermesine çözümü resmen 2006'da kabul edilmiştir. 2010'da düzenlenen bir yarışmada dünyanın en zor matematik problemlerinden birini çözdüğü için milenyum ödülü verilmiş, ödülü almayacağını açıklamıştır.

He is a Russian mathematician who solved Poincaré problem, one of the biggest unsolved problems in mathematics. Perelman, who had resigned from his position at the Steklov Institute in St. Petersburg and fell of the face of the earth, was reported to have stopped associating himself with mathematics, as he was in a psychologically difficult period for him. Perelman's solution proposal for Poincaré, which is hardly understood even by experts, was formally adopted in 2006. In a contest held in 2010, the one million award was awarded to him for solving one of the world's most difficult mathematical problems, but he announced that he would not take the award.

# DELTOİD ve YAMUK
# DELTOID and TRAPEZOID

**Bu bölüm 48 çözümlü test sorusu ve 36 test sorusu içermektedir.**

**This chapter includes 48 test questions with solutions and 36 test questions.**

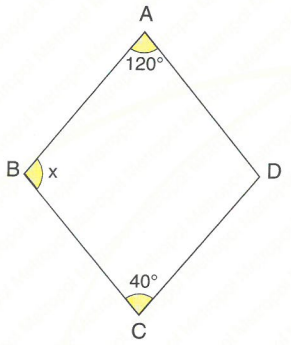
**BÖLÜM / CHAPTER 10**

**DELTOİD ve YAMUK / DELTOID and TRAPEZOID**

# DELTOİD ve YAMUK
# DELTOID and TRAPEZOID

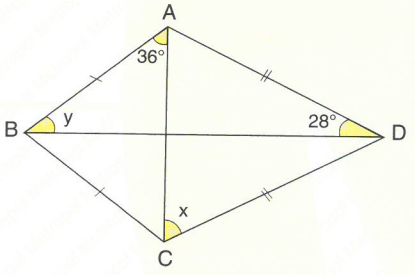


**1.** ABCD bir deltoiddir.
ABCD is a deltoid.
$m(\widehat{BAD}) = 120°$,
$m(\widehat{BCD}) = 40°$
$\Rightarrow$ **$m(\widehat{ABC}) = x = ?$**



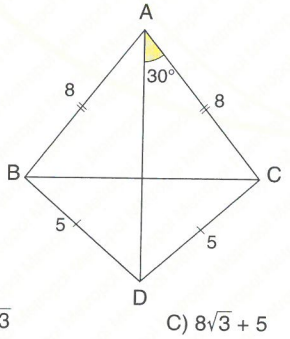

A) 90° B) 100° C) 110° D) 120° E) 125°

**2.** $|AB| = |BC|$,
$|AD| = |DC|$,
$m(\widehat{BAC}) = 36°$,
$m(\widehat{ADB}) = 28°$,
$m(\widehat{ABD}) = y$,
$m(\widehat{DCA}) = x$.
$\Rightarrow$ **$x - y = ?$**



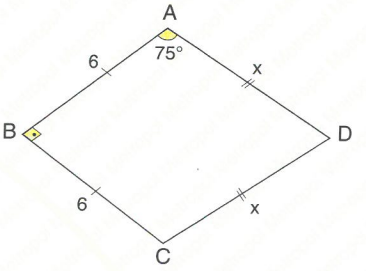

A) 6° B) 8° C) 10° D) 12° E) 16°

**3.** $|AB| = |AC| = 8$ cm,
$|BD| = |DC| = 5$ cm,
$m(\widehat{DAC}) = 30°$
$\Rightarrow$ **$|AD| + |BC| = ?$ cm**



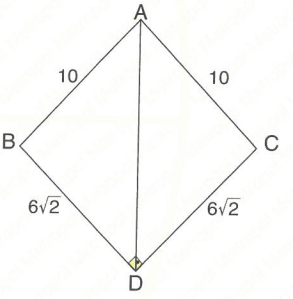

A) 26 B) $16 + 6\sqrt{3}$ C) $8\sqrt{3} + 5$ D) 14 E) $11 + 4\sqrt{3}$

**4.** $|AB| = |BC| = 6$ cm,
$|AD| = |DC|$,
$m(\widehat{B}) = 90°$,
$m(\widehat{A}) = 75°$
$\Rightarrow$ **$|AD| = x = ?$ cm**



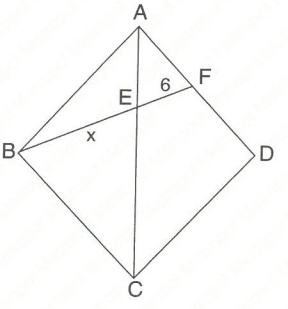

A) $6\sqrt{2}$ B) $2\sqrt{3}$ C) $2\sqrt{2}$ D) $2\sqrt{6}$ E) 8

**5.** $m(\widehat{BDC}) = 90°$,
$|AB| = |AC| = 10$ cm,
$|BD| = |DC| = 6\sqrt{2}$ cm
$\Rightarrow$ **$|AD| = ?$ cm**



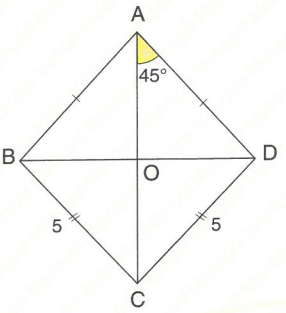

A) 8 B) 10 C) 12 D) 14 E) 16

**6.** $|AB| = |AD|$,
$|BC| = |CD|$,
$\frac{|AF|}{|FD|} = \frac{3}{7}$
$\Rightarrow$ **$|BE| = x = ?$ cm**



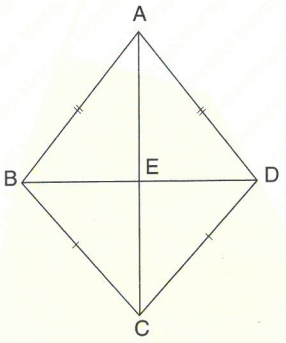

A) 20 B) 18 C) 14 D) 10 E) 8

**7.** IABI = IADI,
IBCI = ICDI = 5 cm,
$m(\widehat{CAD}) = 45°$,
IBDI = 8 cm
⇒ **A(ABCD) = ? cm²**



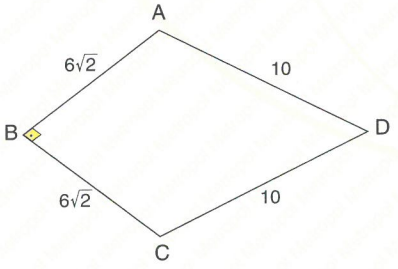

A) 28 B) 24 C) 18 D) 16 E) 14

**8.** ABCD bir deltoiddir.
ABCD is a deltoid.
IABI = IADI,
IBCI = IDCI,
IBDI = 8 cm,
5·IAEI = 3·IECI,
$A(\widehat{ABE}) = 15\ cm^2$
⇒ **IACI = ? cm**




A) 16 B) 18 C) 20 D) 24 E) 28

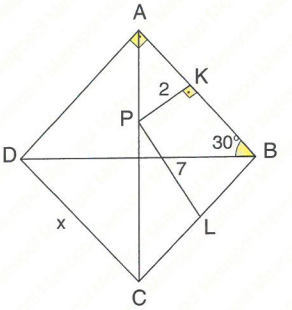
**9.**




IABI = IBCI = $6\sqrt{2}$ cm, IADI = IDCI = 10 cm
⇒ **A(ABCD) = ? cm²**

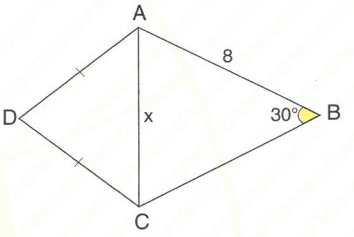
A) $60\sqrt{2}$ B) 168 C) $42\sqrt{2}$ D) 84 E) $36\sqrt{2}$

**10.** IABI = IBCI,
IADI = IDCI,
[PK] ⊥ [AB],
[PL] ⊥ [BC],
$m(\widehat{A}) = 90°$,
$m(\widehat{ABD}) = 30°$
⇒ **IDCI = x = ? cm**



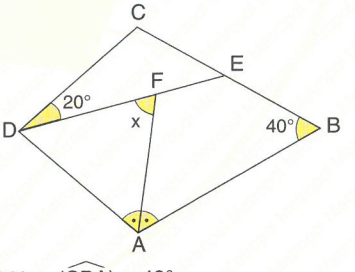

A) 3 B) $3\sqrt{3}$ C) $2\sqrt{3}$ D) $4\sqrt{2}$ E) 6

**11.** ABCD bir deltoiddir.
ABCD is a deltoid.
IADI = IDCI,
IABI = 8 cm,
$m(\widehat{ABC}) = 30°$
⇒ **IACI = x = ? cm**




A) $\sqrt{144-3\sqrt{57}}$ B) $8\sqrt{2-\sqrt{3}}$ C) $5\sqrt{13+\sqrt{6}}$ D) $\sqrt{183}$ E) $\sqrt{131}$

**12.**



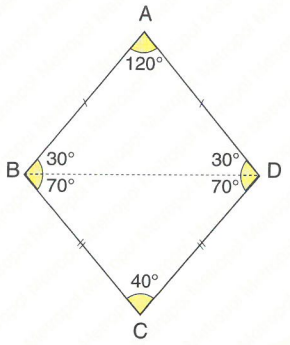

$m(\widehat{CDE}) = 20°$, $m(\widehat{CBA}) = 40°$
IDCI = IDAI, ICBI = IABI,
IDAI = IAFI ⇒ **$m(\widehat{DFA}) = x = ?$**

A) 45° B) 50° C) 55° D) 60° E) 65°

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | B | E | D | D | A | A | C | D | E | B | D |

**1.**



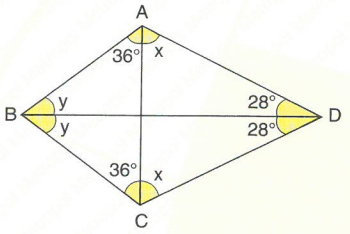

ABCD bir deltoiddir. / ABCD is a deltoid.

$|AB| = |AD|$ (&) $|BC| = |CD|$

$\Rightarrow x = 30° + 70° = 100°$

**Yanıt / Answer B**

**2.**



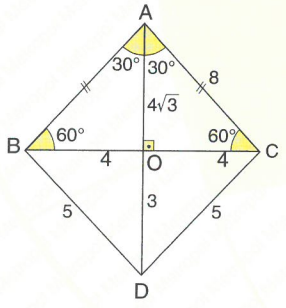

$2y = 108° \Rightarrow y = 54°$

$2x = 124° \Rightarrow x = 62°$

$\Rightarrow x - y = 62° - 54° = 8°$

**Yanıt / Answer B**

**3.**




$|AC| = 8$ cm $\Rightarrow |OA| = 4\sqrt{3}$ cm $\Rightarrow |OC| = |OB| = 4$ cm

$|OD|^2 = |DC|^2 - |OC|^2$

$|OD|^2 = 5^2 - 4^2$

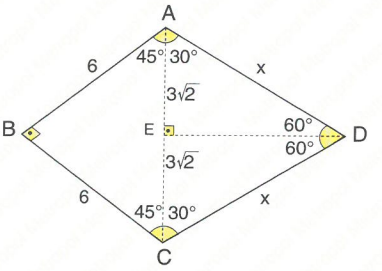
$= 25 - 16$

$|OD|^2 = 9 \Rightarrow |OD| = 3$ cm

$\Rightarrow |AD| + |BC| = 11 + 4\sqrt{3}$ cm

**Yanıt / Answer E**

**4.**

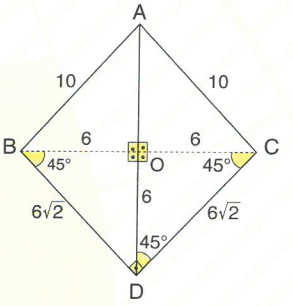



$\Rightarrow |AB| = |BC| = 6$ cm $\Rightarrow |AC| = 6\sqrt{2}$ cm

$|AE| = 3\sqrt{2} \Rightarrow |AD| = (3\sqrt{2})\cdot\left(\frac{2}{\sqrt{3}}\right) = 2\sqrt{6}$ cm

**Yanıt / Answer D**

**5.**




$|BC| = 6\sqrt{2}\cdot\sqrt{2} = 12$ cm

$|OC| = |OB| = 6$ cm

$|AB|^2 = |OB|^2 + |OA|^2$

$10^2 = 6^2 - |OA|^2$

$|OA|^2 = 10^2 - 6^2 = 64 \Rightarrow |OA| = 8$ cm

$|OD| = 6$ cm $\Rightarrow |AD| = 14$ cm

**Yanıt / Answer D**

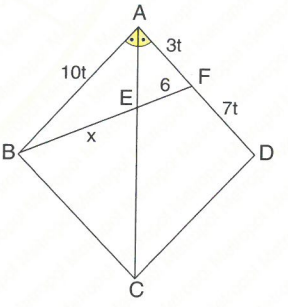
**6.** [ AC ] bir açıortaydır.

[ AC ] is a bisector.

$\frac{|AB|}{|AF|} = \frac{|BE|}{|EF|}$

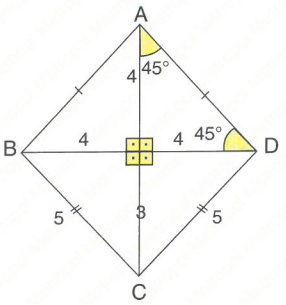
$\frac{10t}{3t} = \frac{x}{6}$

$x = 20$ cm




**Yanıt / Answer A**

**7.**




$m(\widehat{OAD}) = m(\widehat{ODA}) = 45°$

$|AO| = |OD| = 4$ cm

$|DC|^2 = |OC|^2 + |OD|^2$ [ Pythagor ]

$5^2 = |OC|^2 + 4^2 \Rightarrow |OC| = 3$ cm

$A(ABCD) = \dfrac{|AC| \cdot |BD|}{2} = \dfrac{7 \cdot 8}{2} = \dfrac{56}{2} = 28\,cm^2$

**Yanıt / Answer A**

**8.**

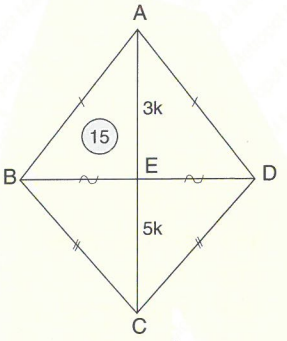
$A(\widehat{ABD}) = 30\,cm^2$

$A(\widehat{EDC}) = 25\,cm^2$

$A(\widehat{BDC}) = 50\,cm^2$

$\dfrac{3k}{5k} = \dfrac{A(\widehat{ABD})}{A(\widehat{BDC})}$

$A(\widehat{BDC}) = 50cm^2$

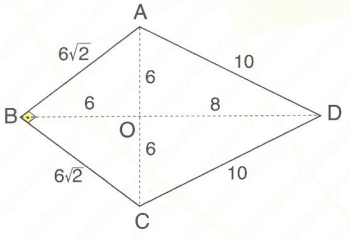



$A(ABCD) = A(\widehat{ABD}) + A(\widehat{BDC}) = 30 + 50 = 80\ cm^2$

$A(ABCD) = \dfrac{|AC| \cdot 8}{2} \Rightarrow 80 = \dfrac{|AC| \cdot 8}{2} \Rightarrow |AC| = 20$ cm

**Yanıt / Answer C**

**9.**



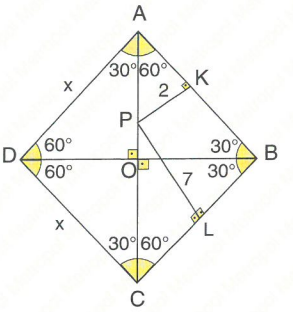

$|AC| = 12$ cm $\Rightarrow$ $10^2 = 6^2 + |OD|^2$

$|OD| = 8$ cm

$\Rightarrow A(ABCD) = \dfrac{12 \cdot 14}{2} = 84\ cm^2$

**Yanıt / Answer D**

**10.**




$\widehat{APK}$ (30°, 60°, 90°)

$|AP| = \dfrac{2}{\sqrt{3}} \cdot 2 = \dfrac{4\sqrt{3}}{3}$

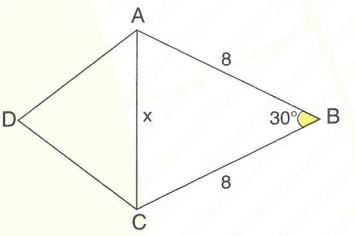
$|PC| = \dfrac{2}{\sqrt{3}} \cdot 7 = \dfrac{14\sqrt{3}}{3}$

$\Rightarrow \begin{cases} |AC| = 6\sqrt{3} \text{ cm} \\ |AO| = 3\sqrt{3} \text{ cm} \end{cases}$

$x = \dfrac{2\sqrt{3}}{3} \cdot 3\sqrt{3} = 6$ cm

**Yanıt / Answer E**

**11.**



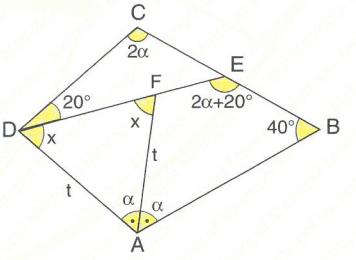

$x^2 = 8^2 + 8^2 - 2 \cdot 8 \cdot 8 \cdot \cos 30°$ [kosinüs teoremi / the cosine theorem]

$x^2 = 128 - 64\sqrt{3}$

$x = \sqrt{64(2-\sqrt{3})} = 8\sqrt{2-\sqrt{3}}$ cm

**Yanıt / Answer B**

**12.**




$\widehat{ADF}$: $2x + \alpha = 180°$ **(I)**

FABE bir dörtgendir. / FABE is a quadrilateral.

$\alpha + (180° - x) + 2\alpha + 20° + 40° = 360°$

$3\alpha - x = 120°$ **(II)**

**I (&) II.** $\Rightarrow x = \dfrac{420°}{7} = 60°$

**Yanıt / Answer D**

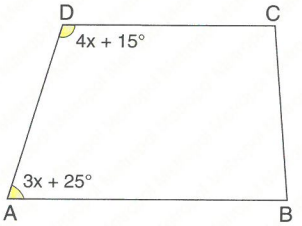
**1.** ABCD bir yamuktur.

ABCD is a trapezoid.

$m(\widehat{DAB}) = 3x + 25°$,

$m(\widehat{ADC}) = 4x + 15°$

$\Rightarrow$ **$m(\widehat{DAB}) = ?$**




A) 60° B) 65° C) 75° D) 80° E) 85°

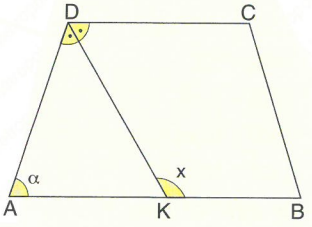
**2.** ABCD bir yamuktur.

ABCD is a trapezoid.

$m(\widehat{ADK}) = m(\widehat{KDC})$,

$m(\widehat{DAB}) = \alpha$

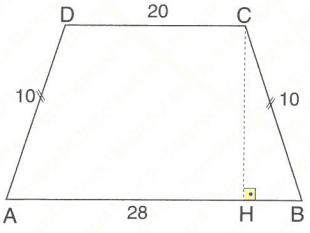
$\Rightarrow$ **$m(\widehat{DKB}) = x = ?$**




A) $2\alpha$ B) $90° - \frac{\alpha}{2}$ C) $90° + \frac{\alpha}{2}$

D) $90° + \alpha$ E) $90° - \alpha$

**3.**




ABCD bir ikizkenar yamuktur.

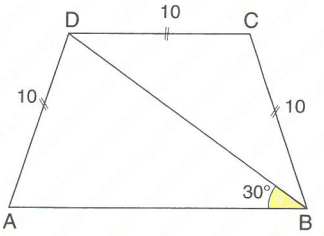
ABCD is an isosceles trapezoid. $|AD| = |BC| = 10$ cm

$|DC| = 20$ cm, $|AH| = 28$ cm

$\Rightarrow$ **Çevre /** Perimeter **(ABCD) = ? cm**

A) 64 B) 72 C) 76 D) 80 E) 84

**4.**




ABCD bir ikizkenar yamuktur.

ABCD is an isosceles trapezoid.

$|AD| = |DC| = |BC| = 10$ cm

$\Rightarrow$ **Çevre /** The perimeter **(ABCD) = ? cm**

A) 35 B) 45 C) 50 D) 55 E) 60

**5.** ABCD bir yamuktur.

ABCD is a trapezoid.

$m(\widehat{DAB}) = 45°$,

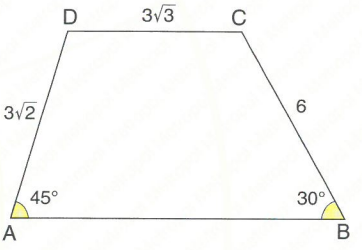
$m(\widehat{CBA}) = 30°$,

$|AD| = 3\sqrt{2}$ cm,

$|CB| = 6$ cm

$|DC| = 3\sqrt{3}$ cm

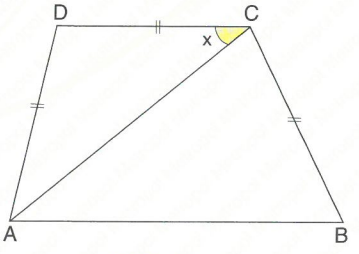
$\Rightarrow$ **$|AB| = ?$ cm**




A) $6\sqrt{3}$ B) $3\sqrt{3}$ C) $2\sqrt{3} + 1$

D) $2(2\sqrt{3} + 1)$ E) $3(2\sqrt{3} + 1)$

**6.**



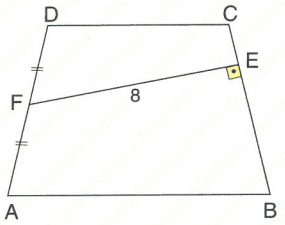

ABCD bir yamuktur. / ABCD is a trapezoid.

$|AD| = |DC| = |CB| = \frac{|AB|}{2} \Rightarrow m(\widehat{DCA})$

**$= x = ?$**

A) 60° B) 45° C) 30° D) 20° E) 15°

**7.**



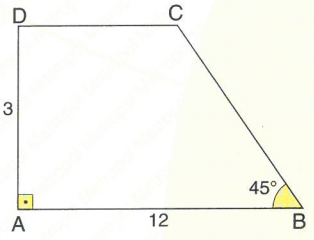

ABCD bir yamuktur./ ABCD is a trapezoid.

IAFI = IFDI, IFEI = 8 cm, IBCI = 10 cm

⇒ **A(ABCD) = ? cm²**

A) 60 B) 70 C) 80 D) 90 E) 100

**8.**

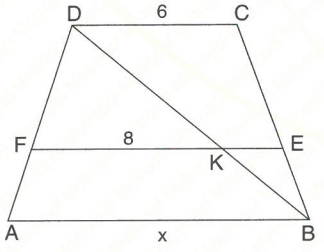



ABCD bir yamuktur./ ABCD is a trapezoid.

m($\widehat{ABC}$) = 45°, IADI = 3 cm, IABI = 12 cm ⇒ **IDCI = ? cm**

A) $3\sqrt{10}$ B) 9 C) $6\sqrt{2}$ D) $2\sqrt{15}$ E) $4\sqrt{3}$

**9.**



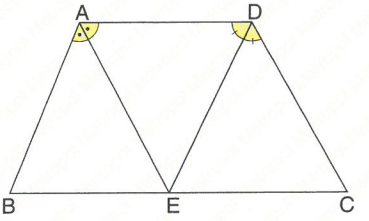

ABCD bir yamuktur./ ABCD is a trapezoid.

[AB] // [FE] // [DC], IDCI = 6 cm, IFKI = 8 cm,

IFEI = 10 cm ⇒ **IABI = x = ? cm**

A) 4 B) 8 C) 12 D) 16 E) 20

**10.**




ABCD bir yamuktur./ ABCD is a trapezoid.

m($\widehat{BAE}$) = m($\widehat{EAD}$), m($\widehat{ADE}$) = m($\widehat{EDC}$),

IADI = 8 cm, IBCI = 12 cm

⇒ **Çevre / The perimeter (ABCD) = ? cm**

A) 30 B) 32 C) 34 D) 36 E) 40

**11.** ABCD bir yamuktur.

ABCD is a trapezoid.

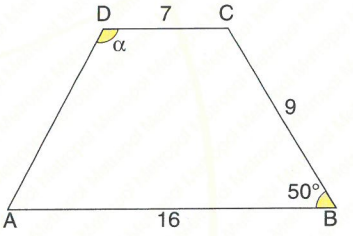
m($\widehat{B}$) = 50°,

IDCI = 7 cm,

IBCI = 9 cm,

IABI = 16 cm

⇒ **m($\widehat{ADC}$) = α = ?**




A) 105° B) 115° C) 130° D) 145° E) 150°

**12.** ABCD bir yamuktur.

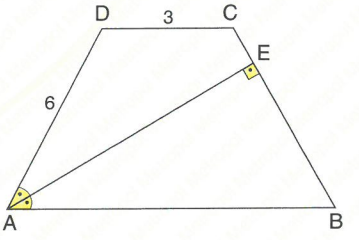
ABCD is a trapezoid.

[AE] ⊥ [BC],

IDCI = 3 cm,

IADI = IBCI = 6 cm

⇒ **IABI = ? cm**

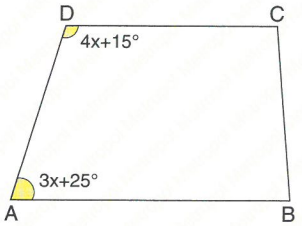



A) 8 B) 9 C) 10 D) 11 E) 13

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | C | C | C | E | C | C | B | C | B | B | B |

**1.**




[AB] // [DC] ⇒ $m(\widehat{A}) + m(\widehat{D}) = 180°$

$3x + 25° + 4x + 15° = 180°$

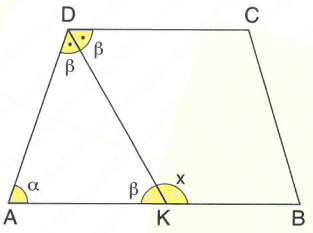
$7x = 140°$

$x = 20°$

$m(\widehat{DAB}) = 3 \cdot 20° + 25° = 85°$

**Yanıt / Answer E**

**2.**



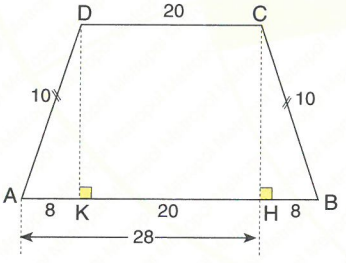

$$\left.\begin{array}{l}\alpha + 2\beta = 180° \\ \beta = 180° - x\end{array}\right\} \Rightarrow \alpha + 360° - 2x = 180°$$

$2x = 180° + \alpha$

$x = 90° + \frac{\alpha}{2}$

**Yanıt / Answer C**

**3.**

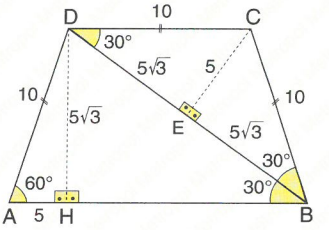



IAHI = 28 cm ⇒ IAKI = IHBI = 8 cm

Çevre / The perimeter (ABCD) = 76 cm

**Yanıt / Answer C**

**4.**




[DC] // [AB] ⇒

$m(\widehat{BDC}) = m(\widehat{ABD}) = 30°$

IADI = ICBI ⇒ $m(\widehat{A}) = m(\widehat{B}) = 60°$,

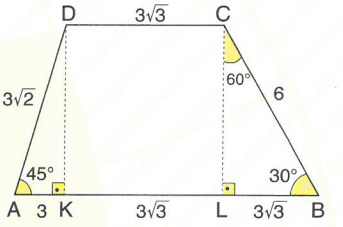
$\widehat{ADB}$ (30°, 60°, 90°),

IADI = 10 cm ⇒ IABI = 20 cm

Çevre / The perimeter (ABCD) = 50 cm

**Yanıt / Answer C**

**5.**



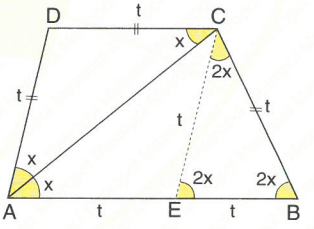

IADI = $3\sqrt{2}$ cm ⇒ IAKI = 3 cm

ICBI = 6 cm ⇒ ILBI = $3\sqrt{3}$ cm

IABI = $3 + 3\sqrt{3} + 3\sqrt{3} = 3(1 + 2\sqrt{3})$ cm

**Yanıt / Answer E**

**6.**

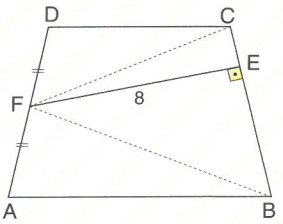



[DA] // [CE] ⇒ $2x + 2x + 2x = 180°$

$x = 30°$

**Yan›t / Answer C**

**7.**

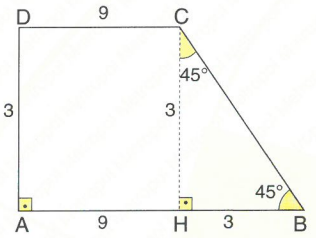



A(ABCD) = IFEI·ICBI

A(ABCD) = 8·10 = 80 $cm^2$

**Yanıt / Answer C**

**8.**



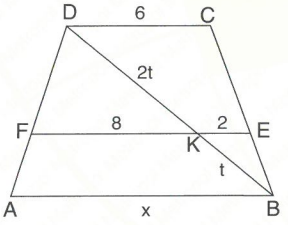

$\widehat{AKD}$ (45°, 45°, 90°)

IHBI = ICHI = 3 cm

IDCI = IAHI = 12 – 3 = 9 cm

**Yanıt / Answer B**

**9.**



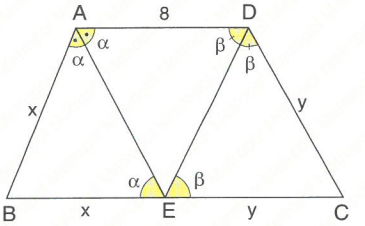

$(\widehat{BEK}) \sim (\widehat{BCD}) \Rightarrow \frac{IBEI}{IBCI} = \frac{IKEI}{IDCI} = \frac{2}{6} = \frac{1}{3}$

$(\widehat{DFK}) \sim (\widehat{DAB}) \Rightarrow \frac{IDKI}{IDBI} = \frac{IFKI}{IABI} \Rightarrow \frac{2}{3} = \frac{8}{x}$

$\Rightarrow$ x = 12cm

**Yanıt / Answer C**

**10.**




IABI = x, IDCI = y

$m(\widehat{EAD}) = m(\widehat{AEB})$ [iç ters açılar / interior opposite angles]

$m(\widehat{ADE}) = m(\widehat{DEC})$ [iç ters açılar / interior opposite angles]

IABI = IBEI & IDCI = IECI,

IBCI = x + y = 12 cm

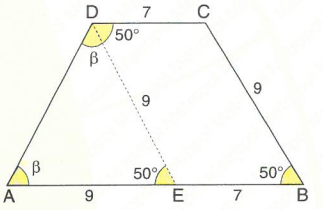
Çevre / The perimeter (ABCD) = 2x + 2y + 8

= 2(x + y) + 8

= 2·12 + 8 = 32 cm

**Yanıt / Answer B**

**11.**




DEBC bir paralelkenardır. / DEBC is a paralellogram.

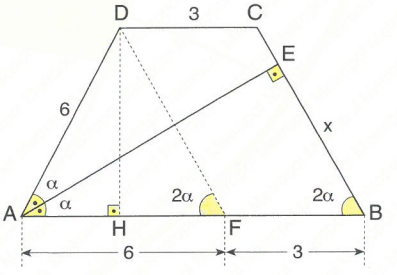
$m(\widehat{CBE}) = m(\widehat{CDE}) = 50°$

$2\beta = 130° \Rightarrow \beta = 65°$

$\Rightarrow \alpha = 65° + 50° = 115°$

**Yanıt / Answer B**

**12.**




$\left.\begin{array}{l}[DF] \,//\, [CB] \\ \perp \widehat{ABE}\end{array}\right\} \Rightarrow \begin{array}{l} 3\alpha = 90° \\ \alpha = 30° \end{array}$

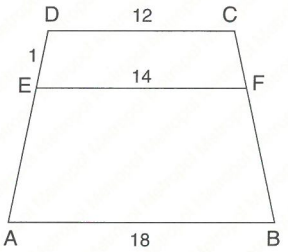
ADF bir eşkenar üçgendir. / ADF is an equilateral triangle.

IADI = IAFI = 6 cm, IFBI = 3 cm

IABI = 9 cm

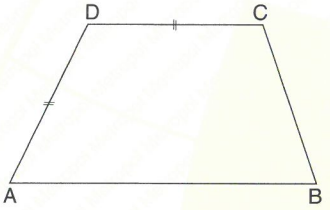
**Yanıt / Answer B**

**1.** ABCD bir yamuktur.
ABCD is a trapezoid.
[DC] // [EF] // [AB],
IDCI = 12 cm,
IABI = 18 cm,
IDEI = 1 cm,
IEFI = 14 cm
⇒ **IEAI = ? cm**




A) 2 B) 3 C) 4 D) 5 E) 6

**2.**




ABCD ikizkenar bir yamuktur.
ABCD is an isosceles trapezoid.
$3 \cdot m(\widehat{DAB}) = m(\widehat{ADC})$ , IADI = IDCI,
Çevre / The perimeter (ABCD) = $(16 + 4\sqrt{2})$ cm
⇒ **IDCI = ? cm**

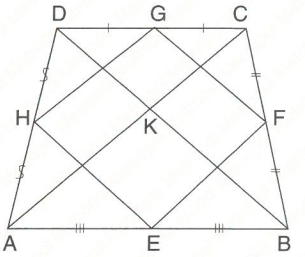
A) 2 B) 4 C) 6 D) 8 E) 10

**3.**


ABCD ikizkenar bir yamuktur.
ABCD is an isosceles trapezoid.
IAEI = IEDI = ICFI = IFBI, $2 \cdot m(\widehat{DAB}) = m(\widehat{ADC})$
IADI = IDCI = ICBI = 8 cm ⇒ **IEFI = ? cm**

A) 9 B) 10 C) 12 D) 14 E) 16

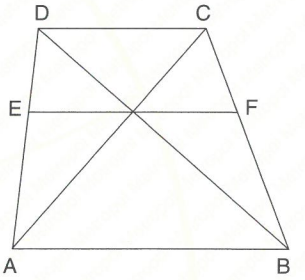
**4.** ABCD bir yamuktur.
ABCD is a trapezoid.
IAEI = EBI,
IBFI = IFCI,
ICGI = IGDI,
IDHI = IHAI,
IACI = 8 cm,
IBDI = 12 cm.




⇒ **Çevre / The perimeter (EFGH) = ? cm**

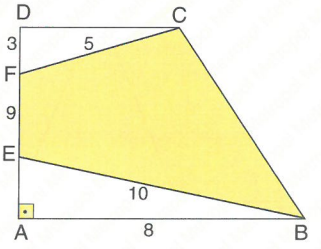
A) 18 B) 20 C) 22 D) 24 E) 26

**5.** ABCD bir yamuktur.
ABCD is a trapezoid.
[AB] // [EF] // [DC],
IABI = 2·IDCI,
IEFI = 12 cm
⇒ **IDCI = ? cm**




A) 5 B) 6 C) 7 D) 8 E) 9

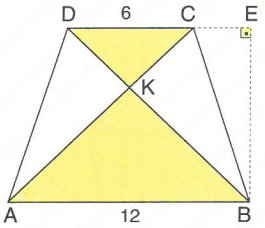
**6.**




ABCD bir dik yamuktur. / ABCD is a right trapezoid.
IABI = 8 cm, IBEI = 10 cm, IFCI = 5 cm,
IDFI = 3 cm, IFEI = 9 cm ⇒ **A(EFCB) = ? cm²**

A) 48 B) 60 C) 72 D) 76 E) 78

**7.**



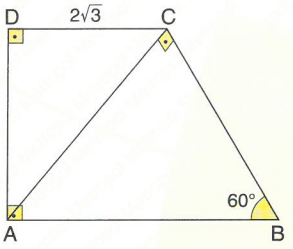

ABCD bir yamuktur. / ABCD is a trapezoid.

IDCI = 6 cm, IABI = 12 cm, IEBI = 8 cm

$\Rightarrow$ **$A(\widehat{AKB}) - A(\widehat{DKC}) = ?\ cm^2$**

A) 16 B) 20 C) 24 D) 28 E) 32

**8.**



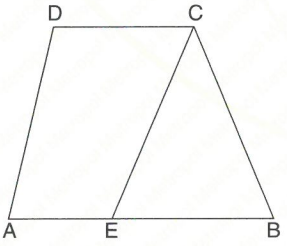

ABCD bir dik yamuktur. / ABCD is a right trapezoid.

[AC] $\perp$ [CB], $m(\widehat{ABC}) = 60°$, IDCI = $2\sqrt{3}$ cm

$\Rightarrow$ **A(ABCD) = ? $cm^2$**

A) $\frac{14\sqrt{3}}{3}$ B) $\frac{10\sqrt{3}}{2}$ C) $10\sqrt{3}$ D) $\frac{20\sqrt{3}}{3}$ E) $\frac{20\sqrt{3}}{2}$

**9.**




ABCD bir yamuktur. / ABCD is a trapezoid.

IABI = x cm, IDCI = y cm,

$2 \cdot A(\widehat{CEB}) = A(ABCD) \Rightarrow$ **IAEI = ? cm**

A) $\frac{x-y}{2}$ B) $\frac{y}{2}$ C) $\frac{x}{4}$ D) $\frac{x-2y}{3}$ E) $\frac{3y-x}{2}$

**10.** ABCD bir yamuktur.

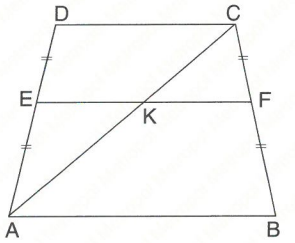
ABCD is a trapezoid.

IAEI = IEDI,

ICFI = IFBI,

$\frac{A(EFCD)}{A(ABFE)} = \frac{3}{7}$

$\Rightarrow \frac{A(\widehat{AEK})}{A(\widehat{CKF})} = ?$




A) $\frac{1}{12}$ B) $\frac{1}{10}$ C) $\frac{1}{9}$ D) $\frac{1}{8}$ E) $\frac{1}{6}$

**11.** ABCD bir yamuktur.

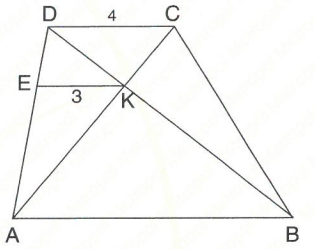
ABCD is a trapezoid.

[EK] // [AB],

IDCI = 4 cm,

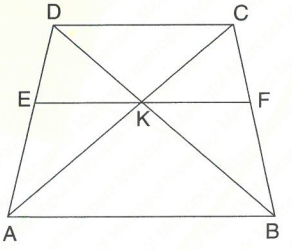
IEKI = 3 cm

$\Rightarrow \frac{A(\widehat{DKC})}{A(\widehat{AKB})} = ?$




A) $\frac{1}{6}$ B) $\frac{1}{7}$ C) $\frac{1}{8}$ D) $\frac{1}{9}$ E) $\frac{1}{10}$

**12.**




ABCD bir ikizkenar yamuktur.

ABCD is an isosceles trapezoid.

[DC] // [EF] // [AB], $A(\widehat{KED}) = 8\ cm^2$,

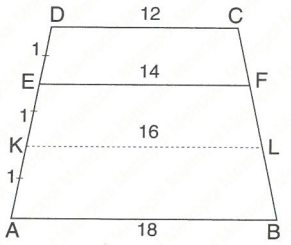
$A(\widehat{KFB}) = 16\ cm^2$, $\frac{ICFI}{IFBI} = \frac{1}{2}$ $\Rightarrow$ **A(ABCD) = ? $cm^2$**

A) 96 B) 100 C) 104 D) 108 E) 112

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | C | B | E | E | C | A | A | C | D | D |

**1.**

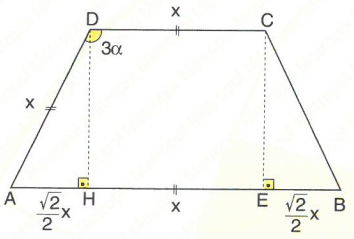



$|AE| = |EK| + |KA|$ [ Thales ]

$= 1 + 1 = 2$ cm

**Yanıt / Answer A**

**2.**




$3\alpha + \alpha = 180° \Rightarrow \alpha = 45°$

AHD ve ECB birer ikizkenar dik üçgendir.

AHD and ECB are isosceles right triangles.

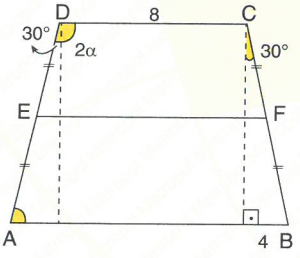
$|AH| = |EB| = \frac{\sqrt{2}}{2}x,$

Çevre / The perimeter (ABCD) $= 4x + \sqrt{2}x = 16 + 4\sqrt{2}$ cm

$|DC| = x = 4$ cm

**Yanıt / Answer B**

**3.**




$2\alpha + \alpha = 180° \Rightarrow \alpha = 60°$

$\widehat{AHD}$ (30°, 60°, 90°) $\Rightarrow |AH| = 4$ cm

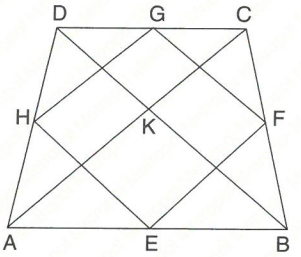
$|AB| = 4 + 8 + 4 = 16$ cm

$|EF| = \frac{8+16}{2}$ [ orta taban / the middle base]

$= 12$ cm

**Yanıt / Answer C**

**4.**




$|HG| = |EF| = \frac{|AC|}{2} = 4$ cm,

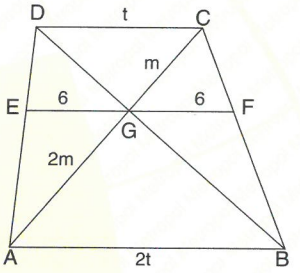
$|GF| = |HE| = \frac{|BD|}{2} = 6$ cm

$\Downarrow$

Çevre / The perimeter (HGFE)= 20 cm

**Yanıt / Answer B**

**5.**



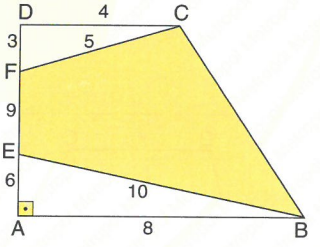

$\widehat{DCG} \sim \widehat{GAB} \Rightarrow \frac{|DC|}{|AB|} = \frac{|GC|}{|GA|} = \frac{t}{2t} = \frac{1}{2}$

$\widehat{AEG} \sim \widehat{ADC}$

$\frac{|EG|}{|DC|} = \frac{|AG|}{|AC|} \Rightarrow \frac{6}{|DC|} = \frac{2m}{3m} \Rightarrow |DC| = 9$ cm

**Yanıt / Answer E**

**6.**



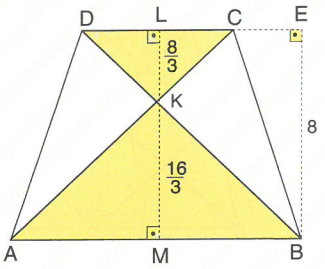

$A(\widehat{DFC}) = \frac{3 \cdot 4}{2} = 6\ cm^2,\ A(\widehat{ABE}) = \frac{6 \cdot 8}{2} = 24\ cm^2$

$A(ABCD) = \frac{18 \cdot (4+8)}{2} = 108\ cm^2$

$A(FEBC) = 108 - (6+24) = 78\ cm^2$

**Yanıt / Answer E**

**7.**

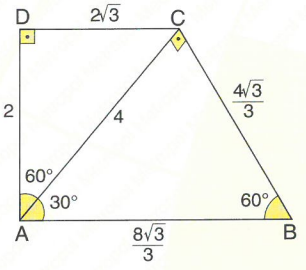



$\widehat{DKC} \sim \widehat{KAB} \Rightarrow |LK| = \frac{8}{3}, |KM| = \frac{16}{3}$

$A(\widehat{AKB}) - A(\widehat{DKC}) = \frac{\frac{16}{3}\cdot 12}{2} - \frac{\frac{8}{3}\cdot 6}{2} = 24 \text{ cm}^2$

**Yanıt / Answer C**

**8.**



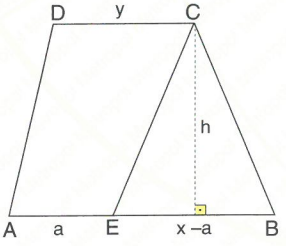

$|DC| = 2\sqrt{3} \Rightarrow \begin{cases} |AD| = 2 \text{ cm}, \\ |AC| = 4 \text{ cm} \end{cases}$

$|AC| = 4 \Rightarrow \begin{cases} |BC| = \frac{4\sqrt{3}}{3} \text{ cm}, \\ |AB| = \frac{8\sqrt{3}}{3} \text{ cm} \end{cases}$

$A(ABCD) = \frac{2\cdot\left(2\sqrt{3} + \frac{8\sqrt{3}}{3}\right)}{2} = \frac{14\sqrt{3}}{3} \text{ cm}^2$

**Yanıt / Answer A**

**9.**



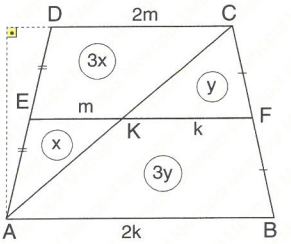

$2.A(\widehat{CEB}) = A(ABCD)$

$2\cdot\frac{h\cdot(x-a)}{2} = \frac{h\cdot(x+y)}{2}$

$2x - 2a = x + y \Rightarrow a = |AE| = \frac{x-y}{2}$

**Yanıt / Answer A**

**10.**




$\widehat{AEK} \sim \widehat{ADC}$

$A(\widehat{AEK}) = x \Rightarrow A(EKCD) = 3x$

$\widehat{CFK} \sim \widehat{CAB}$

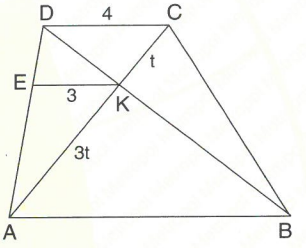
$A(\widehat{CKF}) = y \Rightarrow A(KFBA) = 3y$

$\frac{A(EFCD)}{A(EFAB)}\ \frac{3x+y}{x+3y} = \frac{3}{7} \Rightarrow y = 9x$

$\frac{A(\widehat{AEK})}{A(\widehat{CKF})} = \frac{x}{y} = \frac{x}{9x} = \frac{1}{9}$

**Yanıt / Answer C**

**11.**

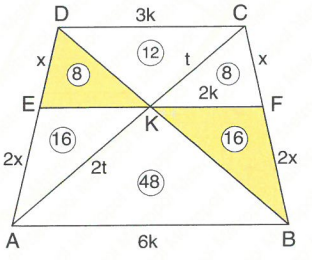



$\widehat{DKC} \sim \widehat{AKB} \Rightarrow$

$\frac{|AK|}{|AC|} = \frac{3}{4} = \frac{3t}{4t} \Rightarrow \frac{A(\widehat{DKC})}{A(\widehat{AKB})} = \left(\frac{1}{3}\right)^2 = \frac{1}{9}$

**Yanıt / Answer D**

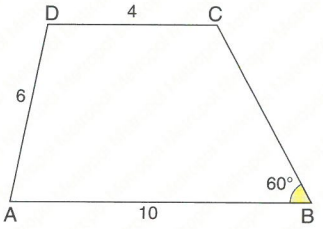
**12.**




$A(ABCD) = 48 + 16 + 8 + 12 + 8 + 16 = 108 \text{ cm}^2$

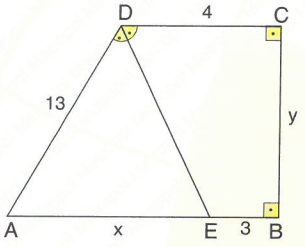
**Yanıt / Answer D**

**1.** ABCD bir yamuktur.
ABCD is a trapezoid.
$m(\widehat{CBA}) = 60°$,
$|AD| = 6$ cm,
$|DC| = 4$ cm,
$|AB| = 10$ cm
$\Rightarrow$ **$m(\widehat{ADC}) = ?$**




A) 100° B) 110° C) 120° D) 140° E) 150°

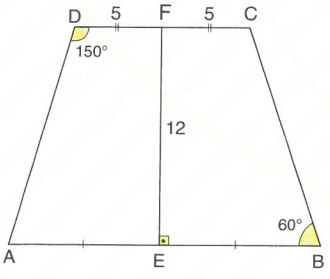
**2.**




ABCD bir dik yamuktur. / ABCD is a right trapezoid.
$m(\widehat{ADE}) = m(\widehat{EDC})$ , $|AD| = 13$ cm, $|DC| = 4$ cm,
$|EB| = 3$ cm, $|AE| = x$ cm, $|BC| = y$ cm
$\Rightarrow$ **$x + y = ?$ cm**

A) 17 B) 18 C) 19 D) 20 E) 21

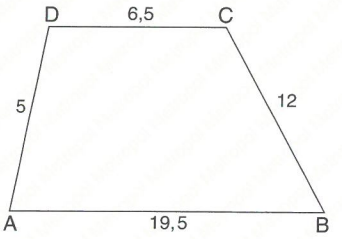
**3.**




ABCD bir yamuktur. / ABCD is a trapezoid.
$m(\widehat{ADC}) = 150°$, $m(\widehat{ABC}) = 60°$, $|DF| = |FC| = 5$ cm,
$[EF] \perp [AB]$, $|FE| = 12$ cm, $|AE| = |EB| \Rightarrow$ **$|AB| = ?$ cm**

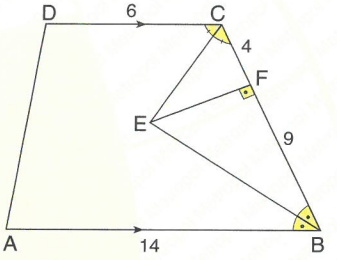
A) $8 + 8\sqrt{3}$ B) $10 + 16\sqrt{3}$ C) $12 + 4\sqrt{3}$
D) $16 + 8\sqrt{3}$ E) $24 + 6\sqrt{3}$

**4.** ABCD bir yamuktur.
ABCD is a trapezoid.
$|AD| = 5$ cm,
$|DC| = 6{,}5$ cm,
$|CB| = 12$ cm,
$|AB| = 19{,}5$ cm
$\Rightarrow$ **$A(ABCD) = ?$ cm$^2$**




A) 39 B) 56 C) 60 D) 72 E) 84

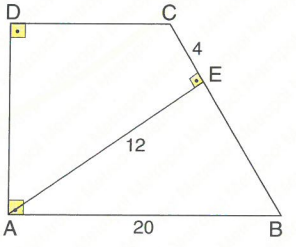
**5.**




ABCD bir yamuktur. / ABCD is a trapezoid.
$[EF] \perp [CB]$, $[DC] \,//\, [AB]$,
$m(\widehat{DCE}) = m(\widehat{ECB})$, $m(\widehat{CBE}) = m(\widehat{EBA})$,
$|CF| = 4$ cm, $|FB| = 9$ cm, $|DC| = 6$ cm, $|AB| = 14$ cm
$\Rightarrow$ **$A(ABCD) = ?$ cm$^2$**

A) 120 B) 130 C) 140 D) 150 E) 160

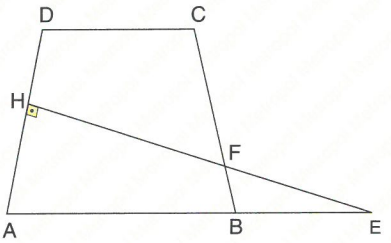
**6.**




ABCD bir dik yamuktur. / ABCD is a right trapezoid.
$[AE] \perp [CB]$, $|AB| = 20$ cm, $|CE| = 4$ cm,
$|AE| = 12$ cm $\Rightarrow$ **$A(ABCD) = ?$ cm$^2$**

A) 108 B) 116 C) 124 D) 136 E) 144

**7.**




ABCD bir yamuktur. / ABCD is a trapezoid.

[EH] ⊥ [AD], IADI = 5 cm, IEHI = 11 cm,

$\frac{|AB|}{8} = \frac{|BE|}{3} = \frac{|DC|}{4} \Rightarrow$ **A(ABCD) = ? cm²**

A) 24 B) 27 C) 30 D) 32 E) 40

**8.** ABCD bir ikizkenar yamuktur.

ABCD is an isosceles trapezoid.

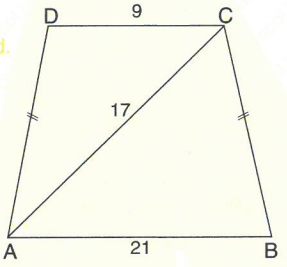
IADI = ICBI,

IABI = 21 cm,

IDCI = 9 cm,

IACI = 17 cm

⇒ **A(ABCD) = ? cm²**




A) 120 B) 125 C) 130 D) 135 E) 140

**9.** ABCD bir yamuktur.

ABCD is a trapezoid.

IDEI = IEAI,

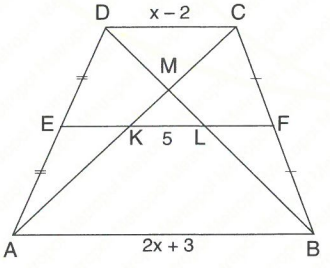
ICFI = IFBI,

IABI = 2x + 3 cm

IDCI = x − 2 cm

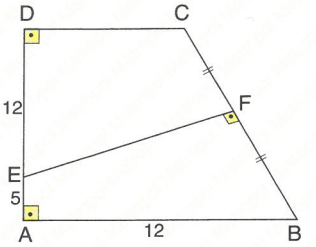
IKLI = 5 cm

⇒ **IEFI = ? cm**




A) 8 B) 10 C) 12 D) 14 E) 16

**10.**




ABCD bir dik yamuktur. / ABCD is a right trapezoid.

[EF] ⊥ [CB], ICFI = IFBI, IAEI = 5 cm,

IEDI = IABI = 12 cm ⇒ **A(ABCD) = ? cm²**

A) $\frac{169}{2}$ B) 98 C) $\frac{225}{2}$ D) $\frac{289}{2}$ E) 162

**11.** ABCD bir yamuktur.

ABCD is a trapezoid.

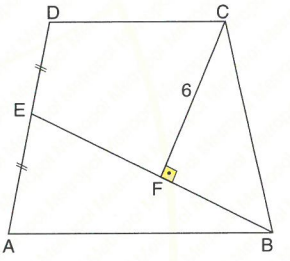
[CF] ⊥ [EB],

IAEI = IEDI,

IBEI = 12 cm,

ICFI = 6 cm

⇒ **A(ABCD) = ? cm²**




A) 60 B) 72 C) 78 D) 84 E) 90

**12.** ABCD bir ikizkenar yamuktur.

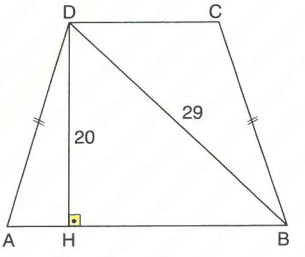
ABCD is an isosceles trapezoid.

IADI = IDCI,

[DH] ⊥ [AB],

IDHI = 20 cm,

IDBI = 29 cm ⇒ **A(ABCD) = ? cm²**

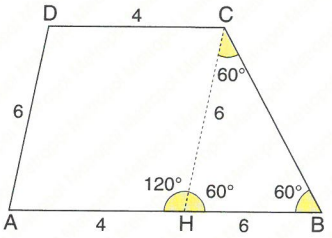



A) 210 B) 290 C) 360 D) 400 E) 420

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | B | B | C | A | E | C | A | A | D | B | E |

**1.**



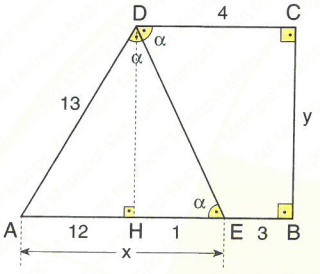

[AD] // [EC],

($\widehat{CHB}$),

IECI = IEBI = 6 cm ⇒ m($\widehat{AEC}$) = m($\widehat{ADC}$) = 120°

**Yanıt / Answer C**

**2.**




[DC] // [AB]

m($\widehat{CDE}$) = m($\widehat{BDE}$)

x = 13 cm,

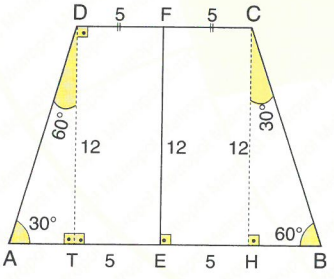
IDCI = IHBI = 4 cm ⇒ $\begin{cases} \text{IHEI} = 1 \text{ cm} \\ \text{IAHI} = 12 \text{ cm} \end{cases}$

y = IDHI = 5 cm

⇒ x + y = 18 cm

**Yanıt / Answer B**

**3.**




$\widehat{ADT}$ (30°, 60°, 90°),

IDTI = 12 ⇒ IATI = $12\sqrt{3}$ cm

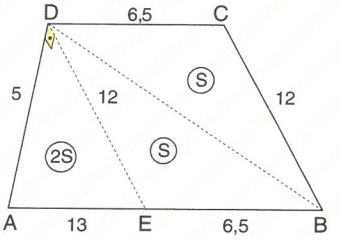
$\widehat{CHB}$ (30°, 60°, 90°),

ICHI = 12 cm ⇒ IHBI = $4\sqrt{3}$ cm

⇒ IABI = $12\sqrt{3} + 10 + 4\sqrt{3} = (10 + 16\sqrt{3})$ cm

**Yanıt / Answer B**

**4.**




[DE] // [CB]

ADE bir dik üçgendir. / ADE is a right triangle.

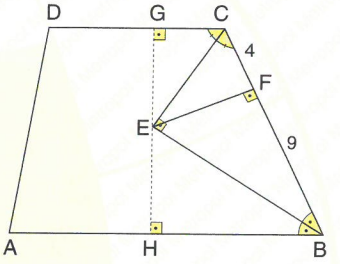
$A(\widehat{ADE}) = 2 \cdot S = \frac{5 \cdot 12}{2}$

$2 \cdot S = 30 \Rightarrow S = 15 \text{ cm}^2$

$A(ABCD) = 4 \cdot S = 4 \cdot 15 = 60 \text{ cm}^2$

**Yanıt / Answer C**

**5.**




$\text{IEFI}^2 = \text{ICFI} \cdot \text{IFBI}$ [ Euclid ]

$= 4 \cdot 9 \Rightarrow \text{IEFI} = 6$ cm

açıortay teoremi / bisector theorem is

IEFI = IEGI = IEHI = 6 cm ⇒ h = IGHI = 12 cm

$A(ABCD) = \frac{12 \cdot (6 + 14)}{2} = 120 \text{ cm}^2$

**Yanıt / Answer A**

**6.**

IBEI = 16 cm

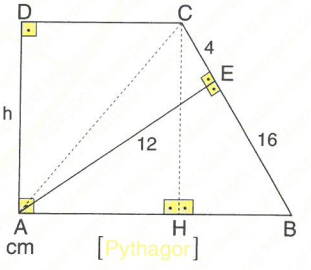
$A(\widehat{ABC}) = \frac{12 \cdot 20}{2}$

$= 120 \text{ cm}^2$

$\frac{h.20}{2} = 120 \text{ cm}^2$

h = 12 cm

IHBI = 16 cm ⇒ IDCI = 4 cm

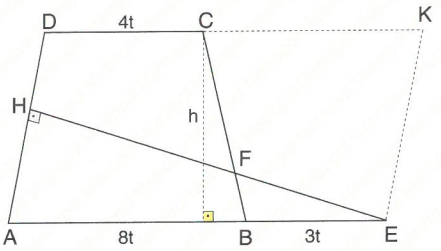



[Pythagor]

$A(ABCD) = \frac{12 \cdot (20 + 4)}{2} = 144 \text{ cm}^2$

**Yanıt / Answer E**

**7.**



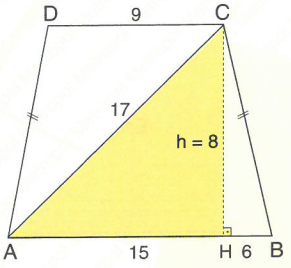

$A(AEKD) = 5 \cdot 11 = 55 = (11 \cdot t) \cdot h \Rightarrow h \cdot t = 5$ cm

$A(ABCD) = \dfrac{(8t+4t)\cdot h}{2} = \dfrac{(12t)\cdot h}{2}$

$= 6(t \cdot h) = 6 \cdot 5 = 30$ cm$^2$

**Yanıt / Answer C**

**8.**




$|HB| = \dfrac{21-9}{2} = 6$ cm

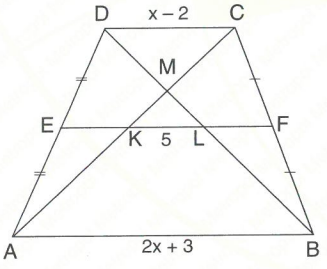
$|CH|^2 = \sqrt{17^2 - 15^2}$ [Pyhtagor]

$\Rightarrow |CH| = 8$ cm

$A(ABCD) = \dfrac{8 \cdot (9+21)}{2} = 120$ cm$^2$

**Yanıt / Answer A**

**9.**




$|KL| = \dfrac{|AB| - |DC|}{2}$

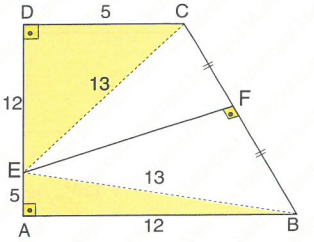
$5 = \dfrac{(2x+3)-(x-2)}{2}$

$x = 5$ cm

$|EF| = \dfrac{|AB| + |DC|}{2} = \dfrac{13+3}{2} = 8$ cm

**Yanıt / Answer A**

**10.**




$|EB|^2 = |AE|^2 + |AB|^2$ [Pythagor]

$= 5^2 + 12^2 \Rightarrow |EB| = 13$ cm

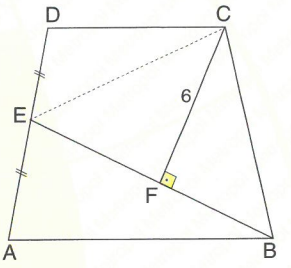
$\left.\begin{array}{l}[EF] \perp [CB] \\ |CF| = |FB|\end{array}\right\} \Rightarrow |EB| = |CE| = 13$ cm

$|DE| = 12$ cm $\Rightarrow |DC| = 5$ cm [Pythagor]

$A(ABCD) = \dfrac{|AB| + |DC|}{2} \cdot |AD| = \dfrac{(12+5)\cdot 17}{2} = \dfrac{289}{2}$ cm$^2$

**Yanıt / Answer D**

**11.**

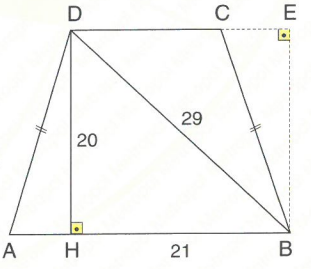



$A(\widehat{EBC}) = \dfrac{6.12}{2} = 36$ cm$^2$

$A(ABCD) = 2 \cdot A(\widehat{EBC}) = 2 \cdot 36 = 72$ cm$^2$

**Yanıt / Answer B**

**12.**




$|DB|^2 = |HD|^2 + |HB|^2$ [Pythagor]

$29^2 = 20^2 + |HB|^2$

$|HB|^2 = 29^2 - 20^2$

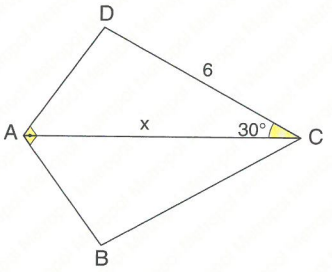
$= 841 - 400$

$|HB|^2 = 441 \Rightarrow |HB| = 21$ cm

$A(ABCD) = A(DHBE) = 21 \cdot 20 = 420$ cm$^2$

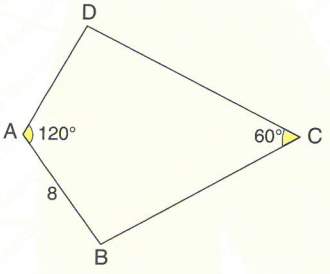
**Yanıt / Answer E**

**1.** ABCD bir deltoittir.
ABCD is a deltoid.
[AD] ⊥ [AB],
m($\widehat{DCA}$) = 30°,
IDCI = 6 cm
⇒ **IACI = x = ? cm**



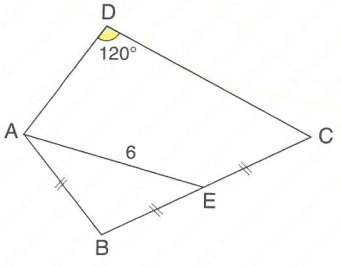

A) $2 + 2\sqrt{3}$ B) $2 + 3\sqrt{3}$ C) $3 + 3\sqrt{3}$ D) $4\sqrt{3}$ E) $6\sqrt{3}$

**2.** ABCD bir deltoittir.
ABCD is a deltoid.
m($\widehat{DAB}$) = 120°,
m($\widehat{DCB}$) = 60°,
IABI = 8 cm
⇒ **A(ABCD) = ? cm²**



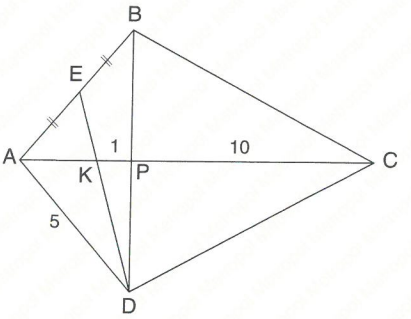

A) $24\sqrt{3}$ B) $36\sqrt{3}$ C) $40\sqrt{3}$ D) $48\sqrt{3}$ E) $64\sqrt{3}$

**3.** ABCD bir deltoittir.
ABCD is a deltoid.
m($\widehat{ADC}$) = 120°,
IABI = IBEI = IECI,
IAEI = 6 cm
⇒ **A(ABCD) = ? cm²**




A) $6\sqrt{3}$ B) $8\sqrt{3}$ C) $10\sqrt{3}$ D) $12\sqrt{3}$ E) $24\sqrt{3}$

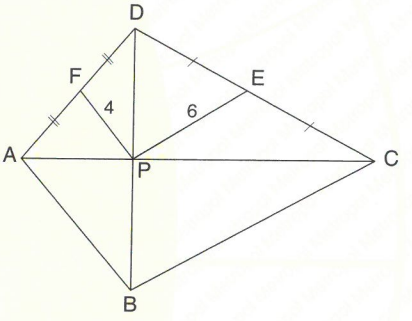
**4.**




ABCD bir deltoittir. / ABCD is a deltoid.
IAEI = IEBI, IKPI = 1 cm, IADI = 5 cm, IPCI = 10 cm
⇒ **A(ABCD) = ? cm²**

A) 48 B) 52 C) 56 D) 64 E) 72

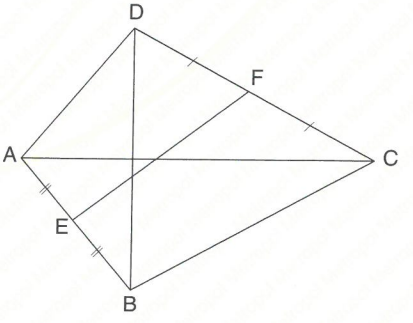
**5.**




ABCD bir deltoittir. / ABCD is a deltoid.
IDFI = IFAI, IDEI = IECI, IPFI = 4 cm, IPEI = 6 cm
⇒ **Çevre / The perimeter (ABCD) = ? cm**

A) 20 B) 25 C) 30 D) 35 E) 40

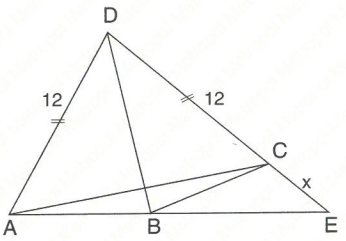
**6.**




ABCD bir deltoittir. / ABCD is a deltoid.
IACI = 24 cm, IDBI = 18 cm ⇒ **IEFI = ? cm**

A) 12 B) 13 C) 14 D) 15 E) 16

**7.**



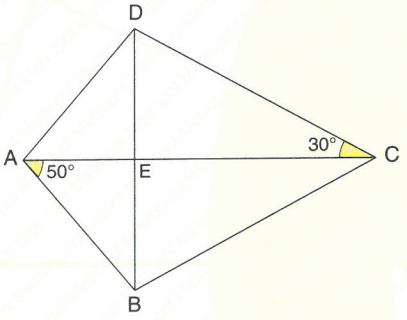

ABCD bir deltoittir. / ABCD is a deltoid.

IDAI = IDCI = 12 cm, 4·IABI = 3·IBEI

⇒ **ICEI = x = ? cm**

A) 4 B) 5 C) 6 D) 7 E) 8

**8.**




ABCD bir deltoittir. / ABCD is a deltoid.

$m(\widehat{DCA}) = 30°$, $m(\widehat{EAB}) = 50°$ ⇒ **$m(\widehat{ABC})$ = ?**

A) 90° B) 95° C) 100° D) 105° E) 110°

**9.** ABCD bir deltoittir.

ABCD is a deltoid.

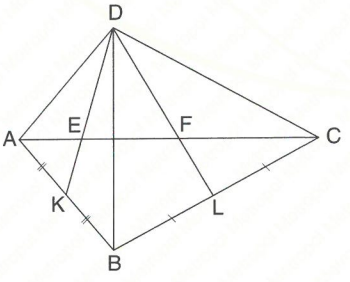
IAKI = IKBI,

IBLI = ILCI,

IEFI = 6 cm,

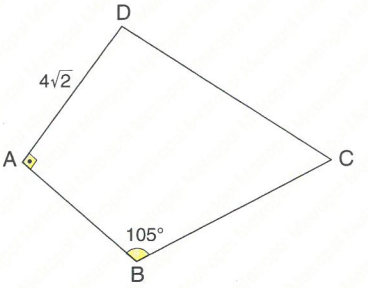
IDBI = 8 cm

⇒ **A(ABCD) = ? cm²**




A) 36 B) 48 C) 64 D)72 E) 96

**10.**

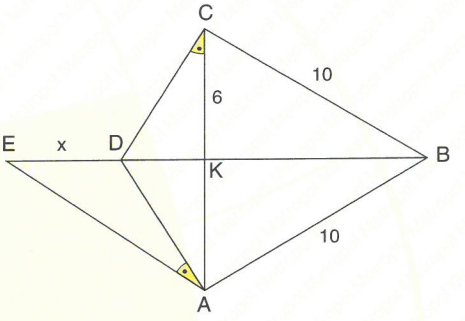



ABCD bir deltoittir. / ABCD is a deltoid.

[AD] ⊥ [AB], IADI = $4\sqrt{2}$ cm ⇒ **A(ABCD) = ? cm²**

A) $8 + 8\sqrt{3}$ B) $8 + 16\sqrt{3}$ C) $12 + 8\sqrt{3}$ D) $12 + 16\sqrt{3}$ E) $16 + 16\sqrt{3}$

**11.**



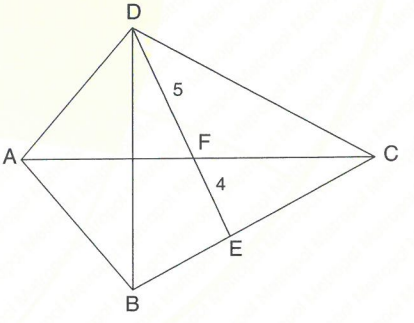

ABCD bir deltoittir. / ABCD is a deltoid.

$m(\widehat{DCA}) = m(\widehat{DAE})$, IDBI = 11 cm, ICBI = IABI = 10 cm,

ICKI = 6 cm ⇒ **IEDI = x = ? cm**

A) 5 B) 6 C) 8 D) 9 E) 10

**12.**




ABCD bir deltoittir. / ABCD is a deltoid.

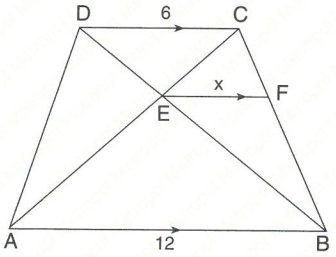
IDFI = 5 cm, IFEI = 4 cm ⇒ $\frac{\text{ICEI}}{\text{IEBI}}$ = ?

A) $\frac{3}{2}$ B) $\frac{4}{3}$ C) $\frac{5}{4}$ D) 3 E) 4

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | E | D | B | E | D | A | C | D | E | A | C |

**1.**




ABCD bir yamuktur. / ABCD is a trapezoid.

[DC] // [EF] // [AB], IDCI = 6 cm, IABI = 12 cm

⇒ **IEFI = x = ? cm**

A) 2 B) 3 C) 4 D) 5 E) 6

**2.** ABCD bir yamuktur.

ABCD is a trapezoid.

[DC] // [AB],

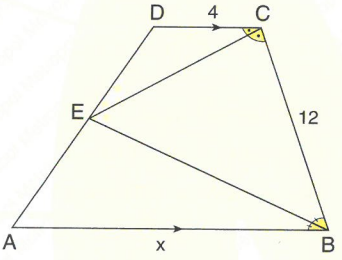
$m(\widehat{DCE}) = m(\widehat{ECB})$,

$m(\widehat{CBE}) = m(\widehat{EBA})$,

IDCI = 4 cm,

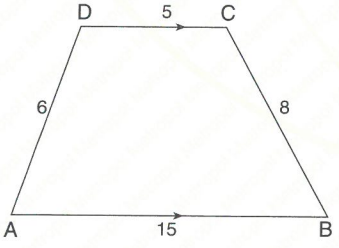
IBCI = 12

⇒ **IABI = x = ? cm**




A) 8 B) 9 C) 10 D) 11 E) 12

**3.**



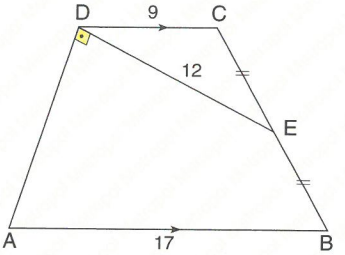

ABCD bir yamuktur. / ABCD is a trapezoid.

IABI = 15 cm, IBCI = 8 cm, IADI = 6 cm, IDCI = 5 cm

⇒ **A(ABCD) = ? cm²**

A) 36 B) 48 C) 54 D) 60 E) 72

**4.**



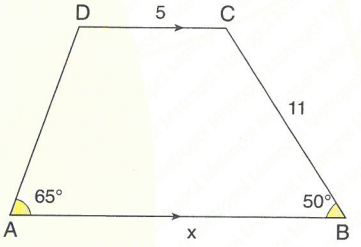

ABCD bir yamuktur. / ABCD is a trapezoid.

[DC] // [AB], ICEI = IEBI, IDCI = 9 cm, IABI = 17 cm

IDEI = 12 cm ⇒ **A(ABCD) = ? cm²**

A) 60 B) 72 C) 84 D) 96 E) 120

**5.**



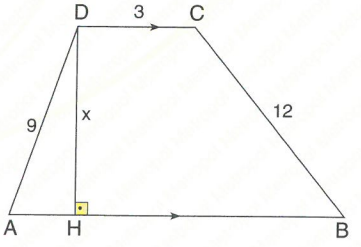

ABCD bir yamuktur. / ABCD is a trapezoid.

[DC] // [AB], $m(\widehat{DAB}) = 65°$, $m(\widehat{CBA}) = 50°$

IDCI = 5 cm, ICBI = 11 cm ⇒ **IABI = x = ? cm**

A) 12 B) 13 C) 14 D) 15 E) 16

**6.**



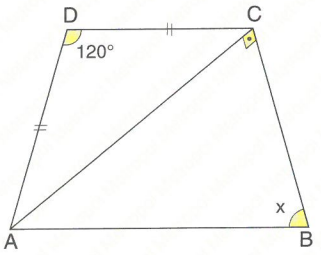

ABCD bir yamuktur. / ABCD is a trapezoid.

[DC] // [AB], [DH] ⊥ [AB], IABI = 18 cm, IBCI = 12 cm,

IADI = 9 cm, IDCI = 3 cm ⇒ **IDHI = x = ? cm**

A) $\frac{13}{3}$ B) $\frac{29}{6}$ C) $\frac{11}{2}$ D) $\frac{36}{5}$ E) $\frac{19}{3}$

**7.**



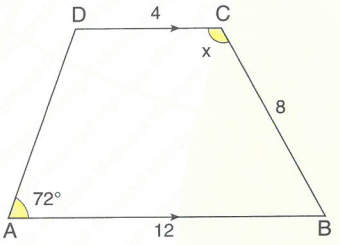

ABCD bir yamuktur. / ABCD is a trapezoid.

[DC] // [AB], [AC] ⊥ [CB], IDCI = IADI,

m($\widehat{ADC}$) = 120° ⇒ **m($\widehat{CBA}$) = x = ? cm**

A) 30° B) 45° C) 50° D) 60° E) 75°

**8.**



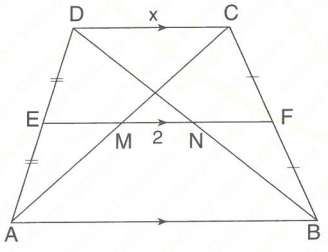

ABCD bir yamuktur. / ABCD is a trapezoid.

[DC] // [AB], m($\widehat{DAB}$) = 72°, IABI = 12 cm,

IBCI = 8 cm, IDCI = 4 cm ⇒ **m($\widehat{DCB}$) = x = ?**

A) 108° B) 112° C) 120° D) 136° E) 144°

**9.**



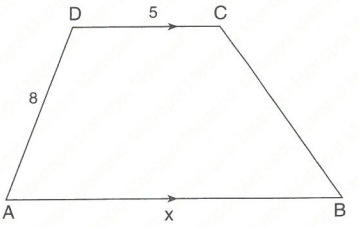

ABCD bir yamuktur. / ABCD is a trapezoid.

[DC] // [EF] // [AB], IDEI = IEAI, ICFI = IFBI,

IMNI = 2 cm, IEFI = 10 cm ⇒ **IDCI = x = ? cm**

A) 4 B) 5 C) 6 D) 7 E) 8

**10.**



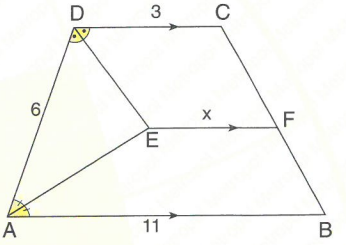

ABCD bir yamuktur. / ABCD is a trapezoid.

[DC] // [AB], m($\widehat{ADC}$) = 2·m($\widehat{CBA}$), IDCI = 5 cm,

IADI = 8 cm ⇒ **IABI = x = ? cm**

A) 12 B) 13 C) 16 D) 18 E) 20

**11.**



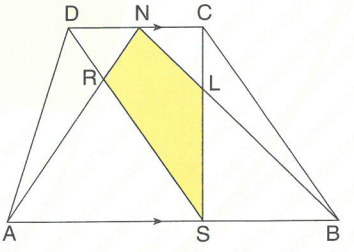

ABCD bir yamuktur. / ABCD is a trapezoid.

[DC] // [EF] // [AB], IDCI = 3 cm, IABI = 11 cm,

IADI = 6 cm ⇒ **IEFI = x = ? cm**

A) 3 B) $\frac{7}{2}$ C) 4 D) $\frac{9}{2}$ E) 5

**12.**




ABCD bir yamuktur. / ABCD is a trapezoid.

[DC] // [AB], A($\widehat{ARD}$) = 12 $br^2(u^2)$, A($\widehat{CLB}$) = 13 $br^2(u^2)$

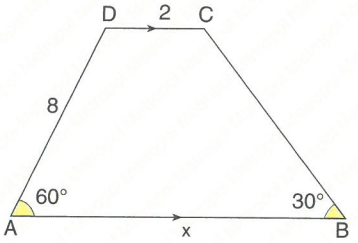
⇒ **A(NRSL) = ? $br^2(u^2)$**

A) 25 B) 30 C) 35 D) 40 E) 45

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | A | B | E | E | D | D | E | E | B | C | A |

**1.**

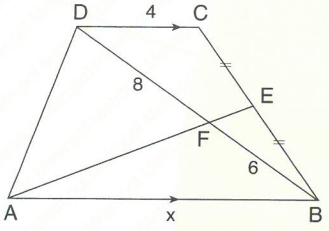



[AB] // [DC], IDCI = 2 cm, IADI = 8 cm

$m(\widehat{DAB}) = 60°$, $m(\widehat{CBA}) = 30°$ ⇒ **IABI = x = ? cm**

A) 14 B) 16 C) 18 D) 20 E) 22

**2.**

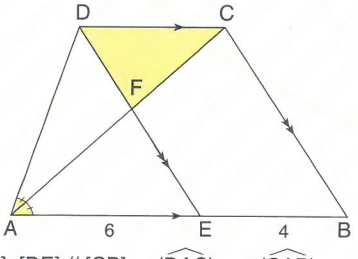



[DC] // [AB], ICEI = IEBI, IDCI = 4 cm, IFBI = 6 cm,

IDFI = 8 cm ⇒ **IABI = x = ? cm**

A) 10 B) 12 C) 14 D) 16 E) 18

**3.**



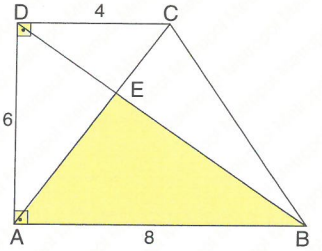

[DC] // [AB], [DE] // [CB], $m(\widehat{DAC}) = m(\widehat{CAB})$

IAEI = 6 cm, IEBI = 4 cm, $A(\widehat{ABC}) = 50\ cm^2$

⇒ **$A(\widehat{DFC}) = ?\ cm^2$**

A) 8 B) 10 C) 12 D) 14 E) 16

**4.**

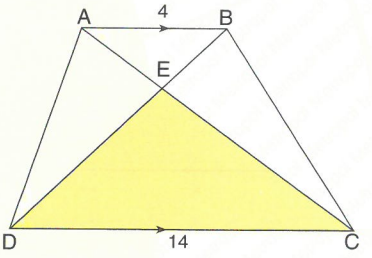



[DC] ⊥ [AD], [AB] ⊥ [AD], IDCI = 4 cm, IADI = 6 cm,

IABI = 8 cm ⇒ **$A(\widehat{ABE}) = ?\ cm^2$**

A) 16 B) 28 C) 30 D) 32 E) 36

**5.**

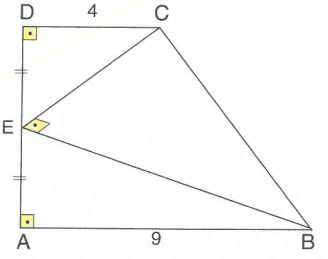



[DC] // [AB], IDCI = 14 cm, IABI = 4 cm,

$A(\widehat{ADB}) = 18\ cm^2$ ⇒ **$A(\widehat{DCE}) = ?\ cm^2$**

A) 32 B) 36 C) 49 D) 72 E) 56

**6.**

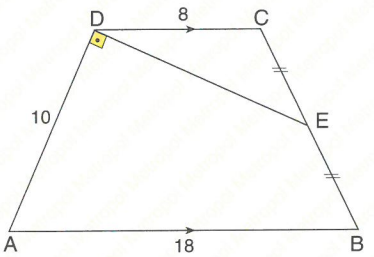



[CD] ⊥ [AD], [AB] ⊥ [AD], [CE] ⊥ [EB], IDEI = IEAI,

IDCI = 4 cm, IABI = 9 cm ⇒ **$A(ABCD) = ?\ cm^2$**

A) 68 B) 78 C) 84 D) 92 E) 98

**7.**

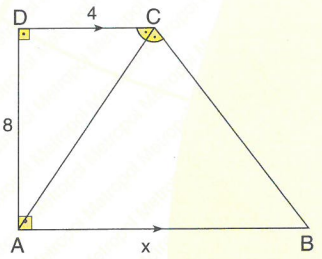



[DC] // [AB], [AD] ⊥ [DE], ICEI = IEBI, IADI = 10 cm,

IDCI = 8 cm, IABI = 18 cm ⇒ **A(ABCD) = ? cm²**

A) 92 B) 96 C) 115 D) 120 E) 124

**8.**

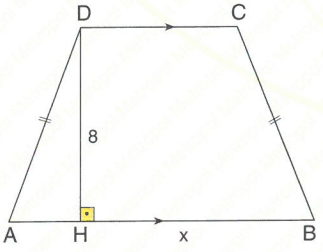



[CD] // [AB], [AB] ⊥ [AD], [AD] ⊥ [DC], m($\widehat{DCA}$) = m($\widehat{ACB}$),

IDCI = 4 cm, IADI = 8 cm ⇒ **IABI = x = ? cm**

A) 9 B) 10 C) 11 D) 12 E) 13

**9.**

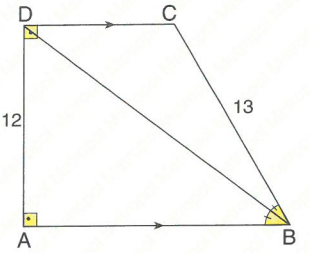



[DC] // [AB], IADI = ICBI, [DH] ⊥ [AB], IDHI = 8 cm,

A(ABCD) = 96 cm² ⇒ **IHBI = x = ? cm**

A) 8 B) 9 C) 10 D) 11 E) 12

**10.**

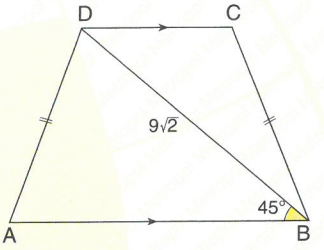



[CD] // [AB], [AB] ⊥ [AD], [AD] ⊥ [DC], m($\widehat{CBD}$) = m($\widehat{DBA}$),

IADI = 12 cm, ICBI = 13 cm ⇒ **A(ABCD) = ? cm²**

A) 144 B) 156 C) 164 D) 172 E) 186

**11.**

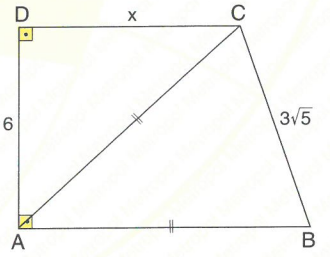



[DC] // [AB], IADI = IBCI, m($\widehat{DBA}$) = 45°,

IDBI = $9\sqrt{2}$ cm ⇒ **A(ABCD) = ? cm²**

A) 49 B) 57 C) 68 D) 81 E) 96

**12.**




[CD] ⊥ [AD], [AB] ⊥ [AD], IACI = IABI, ICBI = $3\sqrt{5}$ cm

IADI = 6 cm ⇒ **IDCI = x = ? cm**

A) $\frac{7}{2}$ B) 4 C) $\frac{9}{2}$ D) 10 E) 12

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | B | A | A | C | B | D | B | E | E | D | C |

# BÖLÜM CHAPTER 11

## TARİHSEL NOT / HISTORICAL NOTE

### Terence Tao [1975 – ]

Matematiğin çeşitli alanlarında çalışmaları bulunan bir Avustralyalı-Amerikalı matematikçidir. Tao, 9 yaşında üniversite düzeyinde matematik derslerine devam eden, erken yaşlardan itibaren olağanüstü matematiksel yetenekler sergiledi. Tao, ilk on yaşında yarışan Uluslararası Matematik Olimpiyatları'nda bugüne kadarki en genç katılımcıydı; 1986, 1987 ve 1988'de bronz, gümüş ve altın madalya kazandı. Olympiat'ın tarihindeki üç madalyanın her birinin en genç kazananı oldu ve on üçüncü doğum gününden kısa bir süre sonra altın madalya kazandı. Matematik alanında, Tao, Oxford Üniversitesi'nden Ben J. Green ile yaptığı işbirliği ile bilinir; birlikte Green-Tao teoremini kanıtladılar. Onun işbirlikçi zihniyetiyle tanınan Tao, 2006 yılına kadar keşiflerinde 30'dan fazla kişi ile çalışmıştı. Tao tarafından 2016 yılında yaklaşık 300 araştırma yazısı ve 17 kitap yayınlanmıştır. 2 numaralı bir Erdös sayısına sahiptir.

He is an Australian-American mathematician who has worked in various areas of mathematics. Tao exhibited extraordinary mathematical abilities from an early age, attending university-level mathematics courses at the age of 9. Tao was the youngest participant to date in the International Mathematical Olympiad, first competing at the age of ten; in 1986, 1987, and 1988, he won a bronze, silver, and gold medal. He remains the youngest winner of each of the three medals in the Olympiad's history, winning the gold medal shortly after his thirteenth birthday. Within the field of mathematics, Tao is known for his collaboration with Ben J. Green of Oxford University; together they proved the Green–Tao theorem. Known for his collaborative mindset, by 2006 Tao had worked with over 30 others in his discoveries. By 2016 Tao had published about 300 research papers and 17 books. He has an Erd's number of 2.

# ÇEMBERDE UZUNLUK ve AÇI
# LENGTH and ANGLE in CIRCLE

**Bu bölüm 48 çözümlü test sorusu ve 24 test sorusu içermektedir.**

**This chapter includes 48 test questions with solutions and 24 test questions.**

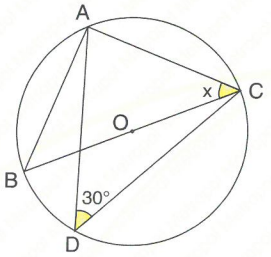
**BÖLÜM / CHAPTER 11**

**ÇEMBERDE UZUNLUK ve AÇI / LENGTH and ANGLE in CIRCLE**

**1.** O noktası şekildeki çemberin merkezidir.
The point O is center of the circle in the figure.

$m(\widehat{ADC}) = 30°$

$\Rightarrow$ **$m(\widehat{ACB}) = x = ?$**



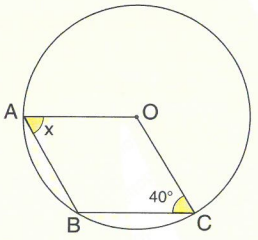

A) 15° B) 20° C) 60° D) 70° E) 80°

**2.** O noktası şekildeki çemberin merkezidir.
The point O is center of the circle in the figure.

[AO] // [BC],

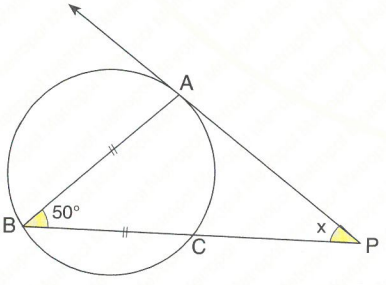
$m(\widehat{BCO}) = 40°$

$\Rightarrow$ **$m(\widehat{OAB}) = x = ?$**




A) 50° B) 55° C) 60° D) 65° E) 70°

**3.**

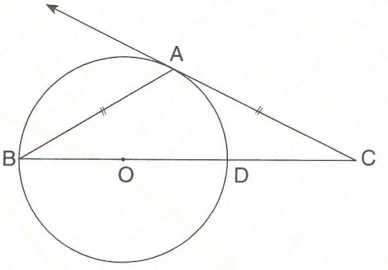



[PA bir teğet doğrusudur. / [PA is a tangent line.

$|AB| = |BC|$, $m(\widehat{ABC}) = 50° \Rightarrow$ **$m(\widehat{APC}) = x = ?$**

A) 10° B) 15° C) 20° D) 25° E) 30°

**4.**




O noktası şekildeki çemberin merkezi, [CA teğet doğrusudur.
The point O is center of the circle and [CA is a tangent line in the figure.

$|AB| = |AC| \Rightarrow$ **$m(\widehat{ABC}) = ?$**

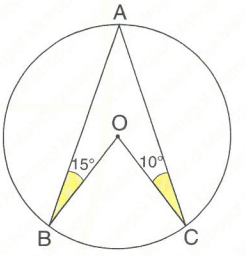
A) 30° B) 35° C) 40° D) 45° E) 50°

**5.** O noktası şekildeki çemberin merkezidir.
The point O is center of the circle in the figure.

$m(\widehat{ABO}) = 15°$,

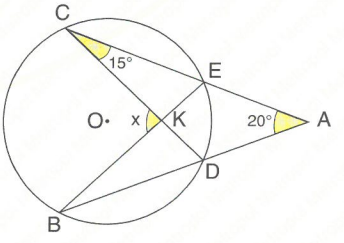
$m(\widehat{OCA}) = 10°$

$\Rightarrow$ **$m(\widehat{BOC}) = ?$**




A) 20° B) 25° C) 30° D) 40° E) 50°

**6.**



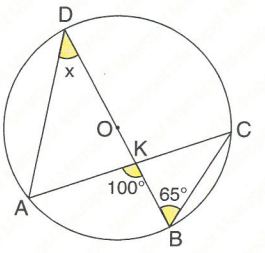

O noktası şekildeki çemberin merkezidir.
The point O is center of the circle in the figure.

$m(\widehat{ECK}) = 15°$, $m(\widehat{CAD}) = 20° \Rightarrow$ **$m(\widehat{CKB}) = x = ?$**

A) 35° B) 40° C)45° D) 50° E) 55°

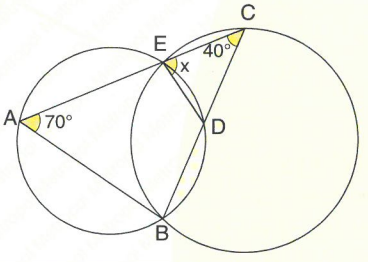
**7.** O noktası şekildeki çemberin merkezidir.
O is center of the circle in the figure.

$m(\widehat{AKB}) = 100°$,
$m(\widehat{KBC}) = 65°$
$\Rightarrow$ **$m(\widehat{ADO}) = x = ?$**




A) 35° B) 40° C)45° D) 50° E) 55°

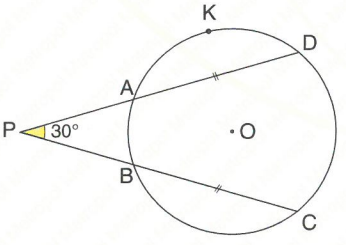
**8.**




$m(\widehat{EAB}) = 70°$, $m(\widehat{ECD}) = 40°$ $\Rightarrow$ **$m(\widehat{CED}) = x = ?$**

A) 55° B) 60° C) 70° D) 75° E) 80°

**9.**



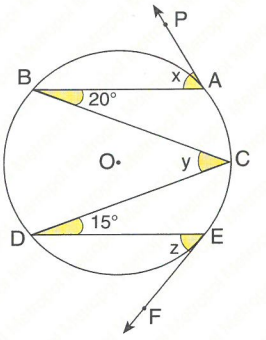

O noktası şekildeki çemberin merkezidir.
The point O is center of the circle in the figure.

$|AD| = |BC|$, $m(\widehat{AB}) = 50°$, $m(\widehat{APB}) = 30°$
$\Rightarrow$ **$m(\widehat{AKD}) = ?$**

A) 100° B) 105° C) 110° D) 120° E) 125°

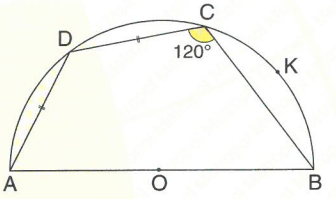
**10.** O noktası şekildeki çemberin merkezidir.
O is center of the circle in the figure.

$m(\widehat{ABC}) = 20°$,
$m(\widehat{CDE}) = 15°$,
$m(\widehat{BAP}) = x$,
$m(\widehat{BCD}) = y$,
$m(\widehat{DEF}) = z$
$\Rightarrow$ **$x + y + z = ?$**




A) 135° B) 140° C) 145° D) 150° E) 160°

**11.**

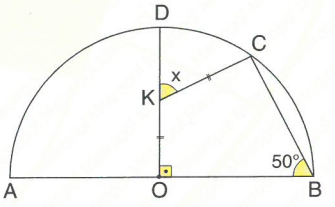



O noktası şekildeki yarım çemberin merkezidir.
The point O is center of the semicircle in the figure.

$|AD| = |DC|$, $m(\widehat{DCB}) = 120°$ $\Rightarrow$ **$m(\widehat{CKB}) = ?$**

A) 50° B) 60° C) 65° D) 70° E) 75°

**12.**




O noktası şekildeki yarım çemberin merkezidir.
The point O is center of the semicircle in the figure.

$[DO] \perp [AB]$, $|KO| = |KC|$, $m(\widehat{DBC}) = 50°$
$\Rightarrow$ **$m(\widehat{DKC}) = x = ?$**

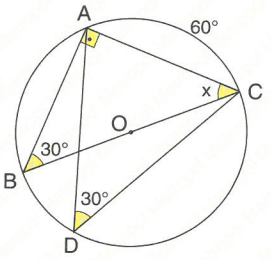
A) 10° B) 15° C) 20° D) 25° E) 30°

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | E | B | A | B | D | A | C | A | C | B | C |

**1.** Çemberde aynı yayı gören açılar eşittir.

The angles that intercepts are the same arc in a circle.




$m(\widehat{ADC}) = m(\widehat{ABC}) = 30°$

Çemberde bir çapı gören açı 90° dir.

The size of an inscribed angle subtending a diameter is 90°.

$m(BAC) = 90°$

$30 + x = 90 \Rightarrow x = 60$

**Yanıt / Answer C**

**2.** $|OB| = |OC| \Rightarrow$

$m(\widehat{OBC}) = m(\widehat{OCB}) = 40°$

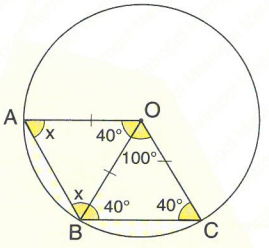
$[AO] // [BC]$,

$m(\widehat{AOC}) = 140°$,

$m(\widehat{AOB}) = 40°$

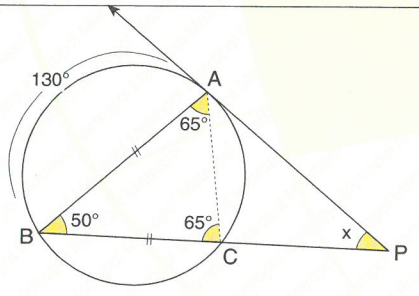
$x + x + 40° = 180°$

$x = 70°$




**Yanıt / Answer E**

**3.**




$\left.\begin{array}{l}\widehat{BC} = 130°\\ \widehat{AB} = 130°\end{array}\right\} \Rightarrow \widehat{AC} = 100°$

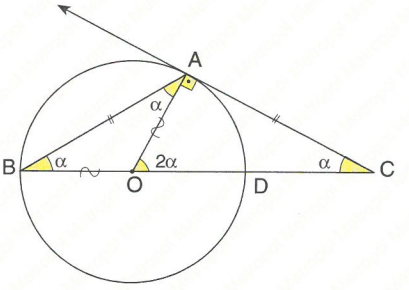
$x = \dfrac{m(\widehat{AB}) - m(\widehat{AC})}{2}$ [İç açı / interior angle]

$= \dfrac{130° - 100°}{2}$

$= 15°$

**Yanıt / Answer B**

**4.**



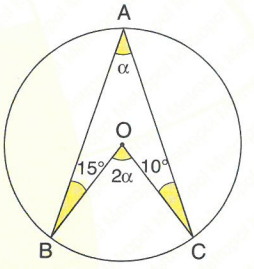

$|AO| = |BO| \Rightarrow m(\widehat{AOC}) = 2\alpha$

$[OA] \perp [AC] \Rightarrow 2\alpha + \alpha = 90°$

$\alpha = 30°$

**Yanıt / Answer A**

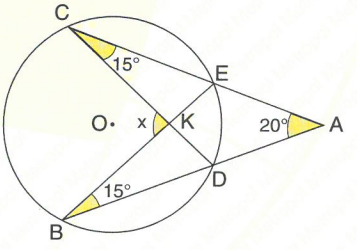
**5.**




$2\alpha = \alpha + 10° + 15° \Rightarrow \alpha = 25° \Rightarrow 2\alpha = 50°$

**Yanıt /Answer E**

**6.**




$\widehat{ECD}$ ve $\widehat{EBD}$ aynı yayı gören açılardır.

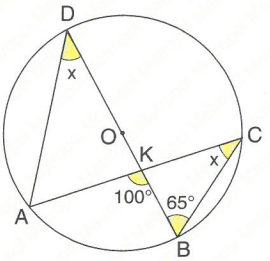
$\widehat{ECD}$ and $\widehat{EBD}$ are intercepts the same arc.

$m(ECD) = m(EBD) = 15°$

$x = 15° + 15° + 20° \Rightarrow x = 50°$

**Yanıt / Answer D**

**7.**




$\widehat{ADB}$ ve $\widehat{ACB}$ aynı yayı gören açılardır.

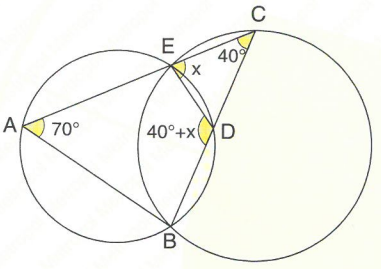
ADC and ACB are intercepts the same arc.

$m(\widehat{ADC}) = m(\widehat{ACB}) = x$

$100° = x + 65° \Rightarrow x = 35°$

**Yanıt / Answer A**

**8.**




$m(\widehat{EDB}) = 40 + x$

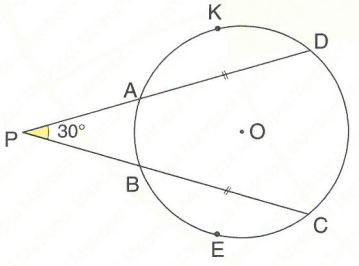
ABDE bir kirişler dörtgenidir.

ABDE is a chords rectangle.

$70° + 40° + x = 180° \Rightarrow x = 70°$

**Yanıt / Answer C**

**9.**




$\widehat{AB} = 50°$, $A\hat{K}D = B\hat{E}C = \alpha$

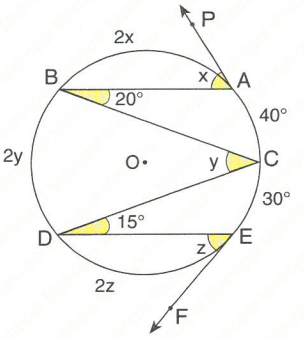
$\dfrac{m(\widehat{DC}) - m(\widehat{AB})}{2} = 30° \Rightarrow m(\widehat{DC}) = 110°$

$|AD| = |BC| \Rightarrow m(A\hat{K}D) = m(B\hat{E}C) = \alpha$

$2\alpha + 50° + 110° = 360° \Rightarrow \alpha = 100°$

**Yanıt / Answer A**

**10.**




$m(\widehat{AC}) = 40°$, $m(\widehat{CE}) = 30°$

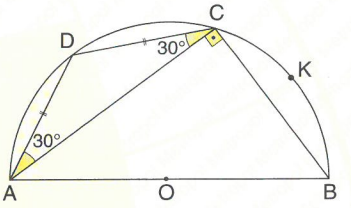
$m\widehat{AB}) = 2x$, $m(\widehat{BD}) = 2y$, $m(\widehat{DZ}) = 2z$

$2x + 2y + 2z = 360° - 40° - 30°$

$x + y + z = 145°$

**Yanıt / Answer C**

**11.**




Çemberde bir çapı gören açı 90° dir.

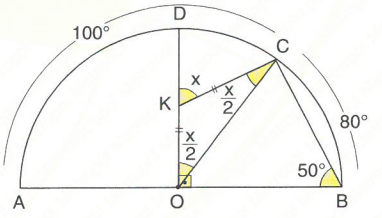
The size of an inscribed angle subtending a diameter is 90°.

$m(\widehat{ACB}) = 90°$, $m(\widehat{DCA}) = m(\widehat{DAC}) = 30°$ dir.

$m(\widehat{AD}) = 60°$, $m(\widehat{DC}) = 60° \Rightarrow m(C\hat{K}B) = 60°$

**Yanıt / Answer B**

**12.**



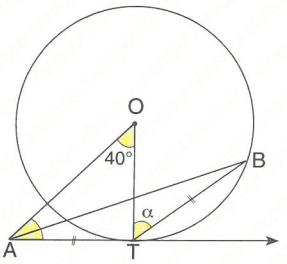

$m(\widehat{CBA}) = 50° \Rightarrow m(A\hat{D}C) = 100° \Rightarrow m(\widehat{CB}) = 80°$

$m(\widehat{CB}) = 80° \Rightarrow m(\widehat{COB}) = 80° \Rightarrow m(\widehat{KOC}) = 10°$

$\dfrac{x}{2} = 10° \Rightarrow x = 20°$

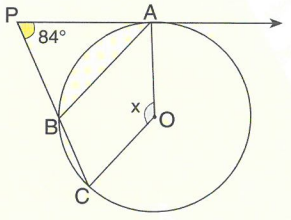
**Yanıt / Answer C**

**1.** [AT], O merkezli çembere T noktasında teğettir.
[AT] is tangent to the circle at point T in the figure.
|AT| = |TB|,
m($\widehat{OAB}$) = m($\widehat{BAT}$),
m($\widehat{AOT}$) = 40° ⇒ **m($\widehat{OTB}$) = α = ?**



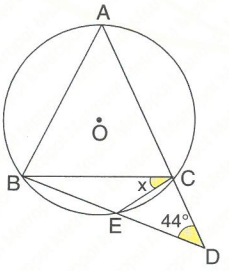

A) 20° B) 25° C) 35° D) 40° E) 45°

**2.** [PA, çembere A noktasında teğettir.
[PA is tangent to the circle at point A in the figure.
[AB] // [CO],
m($\widehat{APC}$) = 84° ⇒ **m($\widehat{AOC}$) = x = ?**



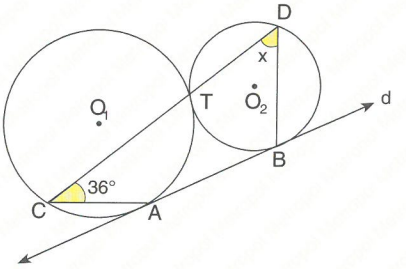

A) 108 B) 112 C) 118 D) 124 E) 126

**3.** O noktası şekildeki çemberin merkezidir.
The point O is center of the circle in the figure.
|AB| = |AC| = |BC|,
m($\widehat{ADB}$) = 44°
⇒ **m($\widehat{BCE}$) = x = ?**




A) 22 B) 32 C) 36 D) 42 E) 44

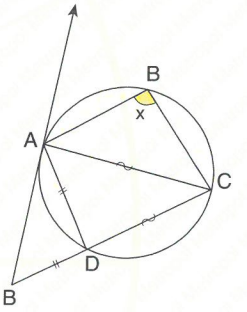
**4.**




d doğrusu şekildeki çemberlere A ve B noktalarında teğettir.
The line d is tangent to the circles at point A and B respectively in the figure.
m($\widehat{DCA}$) = 36° ⇒ **m($\widehat{CDB}$) = x = ?**

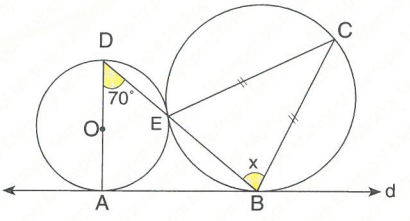
A) 36 B) 48 C) 54 D) 66 E) 72

**5.** [BA, çembere A noktasında teğettir.
[BA is tangent to the circle at point A in the figure.
|AD| = |BD|,
|DC| = |CA|
⇒ **m($\widehat{ABC}$) = x = ?**




A) 124° B) 116° C) 108° D) 96° E) 92°

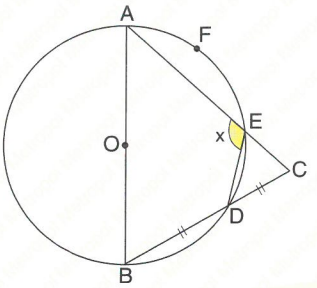
**6.**




|BC| = |CE|, m($\widehat{ADB}$) = 70° ⇒ **m($\widehat{EBC}$) = x = ?**

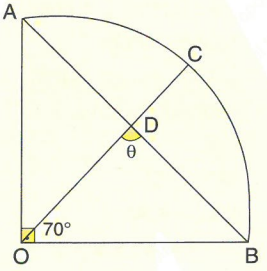
A) 50 B) 60 C) 70 D) 75 E) 80

**7.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
$|BD| = |DC|$,
$m(\widehat{AFE}) = 72°$
$\Rightarrow$ **$m(\widehat{AED}) = x = ?$**



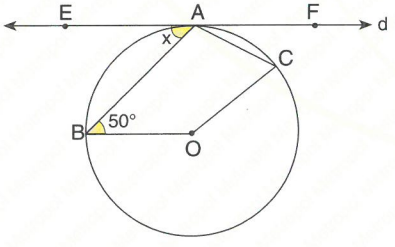

A) 108° B) 112° C) 117° D) 127° E) 133°

**8.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
$m(\widehat{COB}) = 70°$,
$[AB] \cap [OC] = \{D\}$
$\Rightarrow$ **$m(\widehat{ODB}) = \theta = ?$**




A) 80° B) 75° C) 65° D) 60° E) 55°

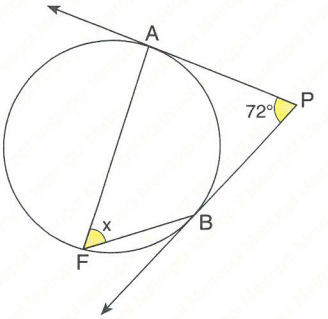
**9.**




d doğrusu şekildeki çemberlere A noktasında teğettir.
The line d is tangent to the circle at the point A in the figure.
$m(\widehat{ABO}) = 50° \Rightarrow$ **$m(\widehat{EAB}) = x = ?$**

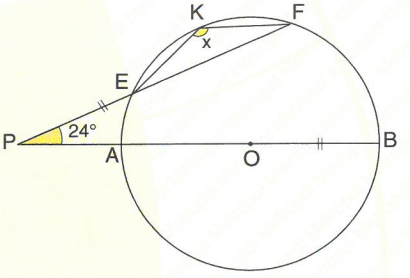
A) 35° B) 40° C) 45° D) 50° E) 60°

**10.** $m(\widehat{APB}) = 72°$
$\Rightarrow$ **$m(\widehat{AB}) = x = ?$**




A) 48° B) 52° C) 54° D) 66° E) 72°

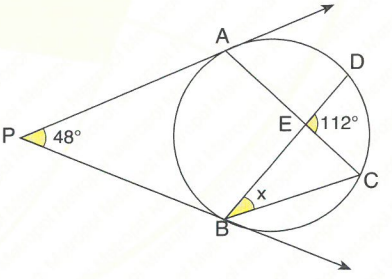
**11.**




O noktası şekildeki çemberin merkezidir.
The point O is center of the circle in the figure.
$|PE| = |OB|$, $m(\widehat{FPB}) = 24° \Rightarrow$ **$m(\widehat{EKF}) = x = ?$**

A) 124° B) 128° C) 134° D) 138° E) 142°

**12.**



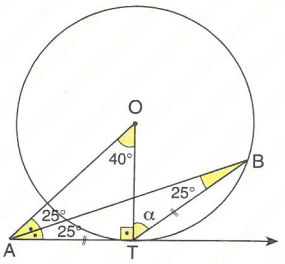

$m(\widehat{APB}) = 48°$, $m(\widehat{DEC}) = 112° \Rightarrow$ **$m(\widehat{DBC}) = x = ?$**

A) 32° B) 36° C) 42° D) 46° E) 48°

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | D | E | C | C | E | C | C | B | C | D | D |

**1.**



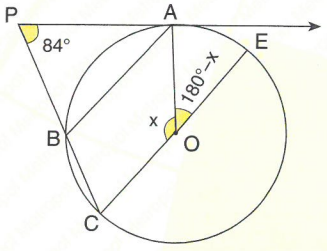

$m(\widehat{AOT}) = 40°$

$m(\widehat{OTA}) = 90° \Rightarrow m(\widehat{OAT}) = 50°$

$\widehat{ATB} \Rightarrow 25° + 25° + \alpha + 90° = 180° \Rightarrow \alpha = 40°$

**Yanıt / Answer D**

**2.**



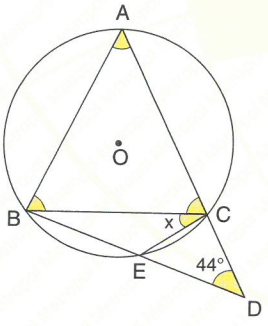

$\widehat{AE} = \widehat{BC} = 180° - x$

$\dfrac{(360° - x) - (2x - 180°)}{2} = 84°$ [dış açı / exterior angle]

$168° = 540° - 3x \Rightarrow x = 124°$

**Yanıt / Answer D**

**3.**




$m(\widehat{BEC}) = m(\widehat{AB}) = 120°$

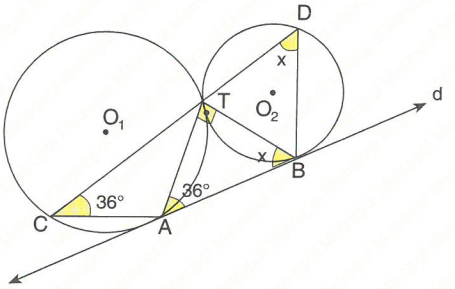
$\dfrac{120° - m(\widehat{EC})}{2} = 44°$ [dış açı / exterior angle]

$m(\widehat{EC}) = 32° \Rightarrow m(\widehat{BE}) = 88°$

$x = \dfrac{m(\widehat{BE})}{2} = \dfrac{88}{2} = 44°$

**Yanıt / Answer E**

**4.**




Çemberde aynı yayı gören açılar eşittir.

The angles that intercepts the same arc are equals.

$m(\widehat{TCA}) = m(\widehat{TAB}) = 36°$

$m(\widehat{TDB}) = m(\widehat{TBA}) = x$

$90° + 36° + x = 180° \Rightarrow x = 54°$

**Yanıt / Answer C**

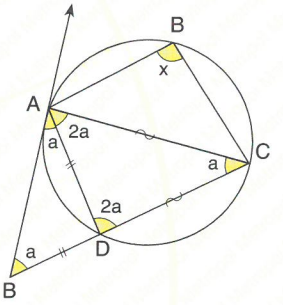
**5.**

$m(\widehat{ABD}) = m(\widehat{BAD}) = a$

$m(\widehat{ADC}) = m(\widehat{DAC}) = 2a$

Çemberde aynı yayı gören açılar eşittir.

The angles that intercepts the same arc are equals.




$m(\widehat{BAD}) = m(\widehat{ACD}) = a$

$2a + a + 2a = 180°$

$a = 36°$

ABCD bir kirişler dörtgenidir.

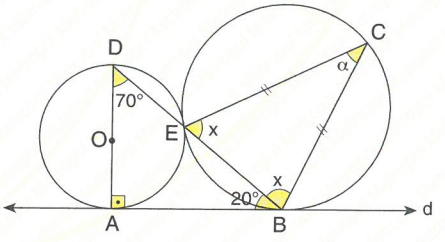
ABCD is a chords rectangle.

$2a + x = 180°$

$2 \cdot 36 + x = 180° \Rightarrow x = 108°$

**Yanıt / Answer C**

**6.**

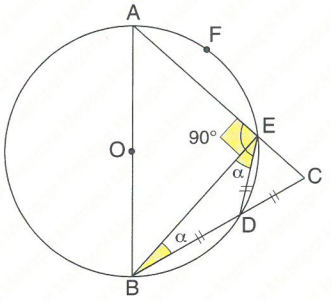



$m(\widehat{DBA}) = 20° \Rightarrow m(\widehat{EB}) = 40°$

$\alpha = 20° \Rightarrow 2x = 160° \Rightarrow x = 80°$

**Yanıt / Answer E**

**7.**




$m(\widehat{BEC}) = 90° \Rightarrow |BD| = |DC| = |ED|$

$m(\widehat{EBC}) = m(\widehat{BED}) = \alpha$

$m(\widehat{AFE}) + m(\widehat{ED}) + m(\widehat{DB}) = 180°$

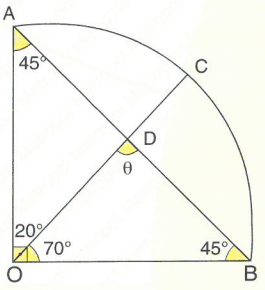
$72° + 2\alpha + 2\alpha = 180°$

$4\alpha = 108° \Rightarrow \alpha = 27°$

$x = 90° + \alpha = 117°$

**Yanıt / Answer C**

**8.**



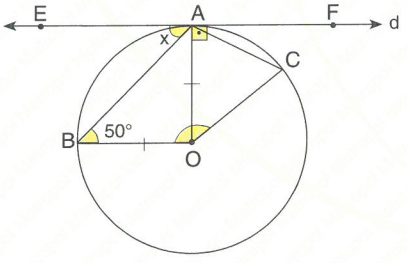

$|AO| = |OB| \Rightarrow m(\widehat{DAB}) = m(OBA) = 45°$

$m(\widehat{COB}) = 70° \Rightarrow m(\widehat{AOC}) = 20°$

$\theta = 45° + 20° = 65°$

**Yanıt / Answer C**

**9.**



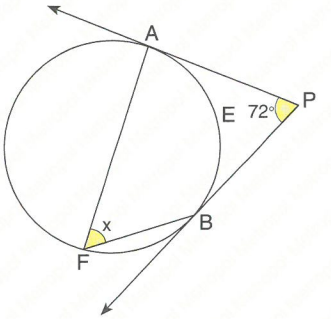

$m(\widehat{DAF}) = 90°$

$|BO| = |OA| \Rightarrow m(\widehat{ABO}) = m(\widehat{OAB}) = 50°$

$50° + x = 90° \Rightarrow x = 40°$

**Yanıt / Answer B**

**10.**




$m(\widehat{APB}) + m(\widehat{AB}) = 180°$

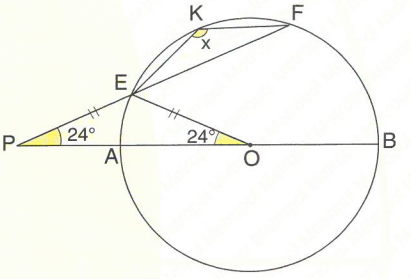
$72° + m(\widehat{AB}) = 180°$

$m(\widehat{AB}) = 108°$

$m(\widehat{AB}) = 2x = 108° \Rightarrow x = 54°$

**Yanıt / Answer C**

**11.**



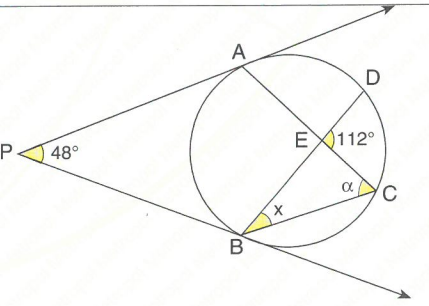

$|PE| = |OB| = |OE| \Rightarrow m(\widehat{EA}) = 24°$

$\dfrac{m(\widehat{FB}) - m(\widehat{EA})}{2} = 24° \Rightarrow m(\widehat{FB}) = 72°$

$m(\widehat{EBF}) = 2x = 24° + 72° + 180° \Rightarrow x = 138°$

**Yanıt / Answer D**

**12.**




$m(\widehat{AB}) + m(\widehat{APB}) = 180°$

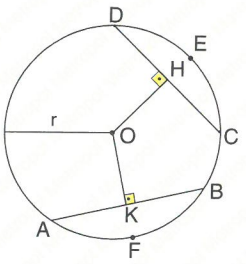
$m(\widehat{AB}) + 48° = 180° \Rightarrow m(\widehat{AB}) = 132°$

$2\alpha = 132° \Rightarrow \alpha = 66°$

$\alpha + x = 112° \Rightarrow x = 112° - 66° = 46°$

**Yanıt / Answer D**

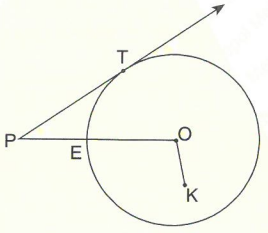
**1.** O noktası şekildeki çemberin merkezidir.
The point O is center of the circle in the figure.




$|\widehat{DEC}| = |\widehat{AFB}|$,
$[OH] \perp [DC]$,
$[OK] \perp [AB]$,
$|DC| = (4x + 2)$ cm,
$|AB| = (5x - 5)$ cm,
$|OH| = (y + 5)$ cm, $|OK| = (3y - 1)$ cm $\Rightarrow$ **r = ? cm**

A) 9 B) 12 C) 13 D) 15 E) 17

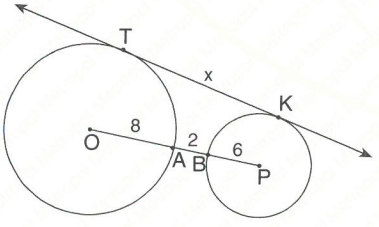
**2.** O noktası şekildeki çemberin merkezi, [PT, teğet doğrusudur.
The point O is center of the circle in the figure, [PT a tangent line.




$|PE| = (2x + 3)$ cm,
$|PF| = (8x + 1)$ cm,
$|PT| = (4x + 3)$ cm $\Rightarrow$ **|PT| = ? cm**

A) 12 B) 14 C) 15 D) 16 E) 17

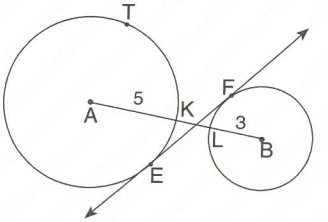
**3.**




[TK], bir teğet doğrusudur. / [TK] is a tangent line.
$|OA| = 8$ cm, $|AB| = 2$ cm, $|BP| = 6$ cm
$\Rightarrow$ **|TK| = x = ? cm**

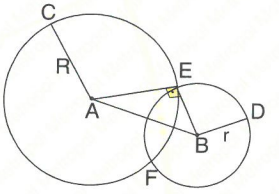
A) $4\sqrt{3}$ B) $8\sqrt{3}$ C) $6\sqrt{3}$ D) $10\sqrt{6}$ E) $6\sqrt{7}$

**4.** $|AK| = 5$ cm,
$|LB| = 3$ cm,
$|EF| = 15$ cm
$\Rightarrow$ **|KL| = ? cm**



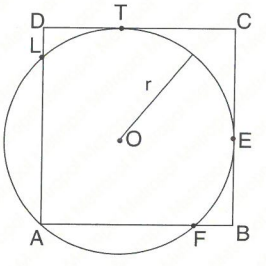

A) 6 B) 7 C) 9 D) 11 E) 17

**5.** $|AC| = R$ cm,
$|BD| = r$ cm,
$R + r = 21$ cm,
$|AB| = 15$ cm
$m(\widehat{AEB}) = 90°$
$\Rightarrow$ **$A(\widehat{ABE})$ = ? cm$^2$**



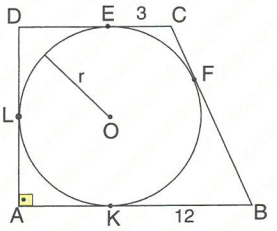

A) 54 B) 48 C) $36\sqrt{3}$ D) $27\sqrt{3}$ E) 27

**6.** ABCD bir dikdörtgendir.
ABCD is a rectangle.
$|AD| = 25$ cm,
$|AB| = 18$ cm
$\Rightarrow$ **r = ? cm**



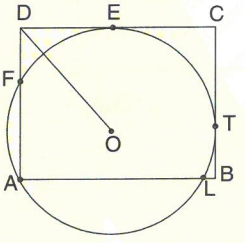

A) 10 B) 13 C) 15 D) 16 E) 17

**7.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure
ABCD yamuğu E, F, K rakamlarında teğettir.
|EC| = 3 cm,
|KB| = 12 cm
⇒ **r = ? cm**



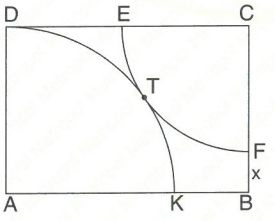

A) $\frac{3}{2}$ B) 3 C) $\frac{9}{2}$ D) 6 E) 7

**8.** O noktası şekildeki çemberin merkezidir.
E ve T noktalarında teğettir.
ABCD bir dikdörtgendir.
ABCD is a rectangle.
|AB| = 27 cm,
|BC| = 24 cm
⇒ **|OD| = ? cm**



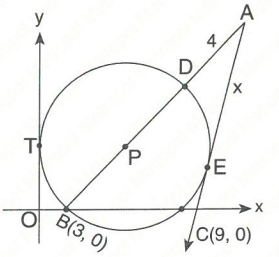

A) $12\sqrt{3}$ B) 15 C) $9\sqrt{6}$ D) $3\sqrt{41}$ E) 19

**9.** A ve C merkezli çeyrek çemberler T noktasında teğettir.
ABCD bir dikdörtgendir.
ABCD is a rectangle.
|DE| = |KB| + 12 cm
⇒ **|FB| = x = ? cm**



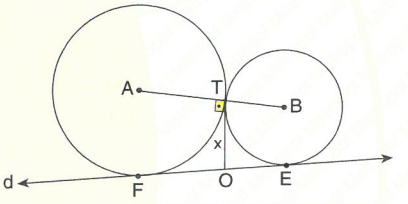

A) 2 B) 6 C) 8 D) 10 E) 12

**10.** P noktası şekildeki çemberin merkezidir.
Point P is center of the circle in the figure
T noktasında Y eksenine teğetir.
B(3, 0),
C( 9, 0)
|AD| = 4 cm
⇒ **|AE| = x = ? cm**




A) 6 B) $4\sqrt{2}$ C) 8 D) 12 E) $8\sqrt{3}$

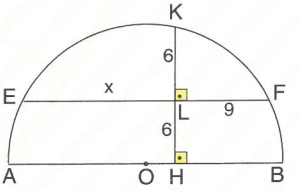
**11.** A ve B merkezli çemberler T noktasında birbirlerine, E ve F noktalarında d, doğrusuna teğettir.




|AT| = 16 cm, |BT| = 9 cm ⇒ **|OT| = x = ? cm**

A) 10 B) 12 C) 16 D) 18 E) 24

**12.** O noktaları şekildeki yarım çemberin merkezidir.
Point P is center of the circle in the figure
[HK] ⊥ [EF],
H ∈ [AB],
[EF] // [AB],
|KL| = |LH| = 6 cm
|LF| = 9 cm
**|EL| = x = ? cm**

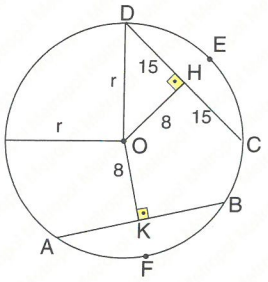



A) 24 B) 18 C) 12 D) $9\sqrt{2}$ E) $12\sqrt{3}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | C | E | C | A | B | D | D | E | C | B | C |

**1.**




O noktası şekildeki çemberin merkezidir.

The point O is center of the circle in the figure.

$|DC| = |AB| \Rightarrow 4x + 2 = 5x - 5$

$x = 7 \text{ cm} \Rightarrow |DC| = 30 \text{ cm}$

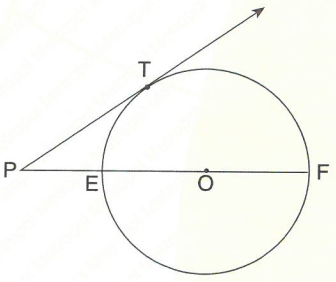
$|OH| = |OK| \Rightarrow y + 5 = 3y - 1 \Rightarrow y = 3 \text{ cm}$

$|OH| = |OK| = 8 \text{ cm}$

$r^2 = 8^2 + 15^2 \Rightarrow r = 17 \text{ cm}$

**Yanıt / Answer E**

**2.**



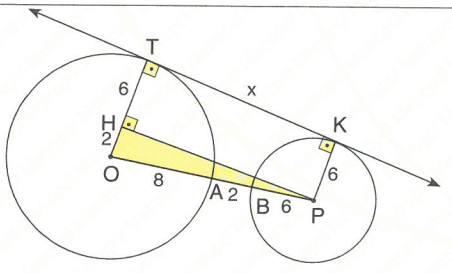

$|PT|^2 = |PE| \cdot |PF| \Rightarrow (4x + 3)^2 = (2x + 3) \cdot (8x + 1)$

$16x^2 + 24x + 9 = 16x^2 + 26x + 3$

$6 = 2x \Rightarrow x = 3 \Rightarrow |PT| = 15 \text{ cm}$

**Yanıt / Answer C**

**3.**



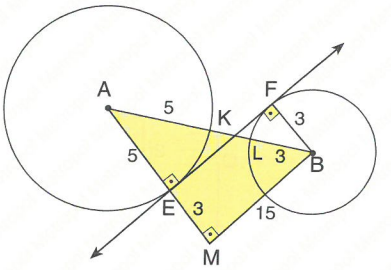

$|TK| = |PH| = x$, $|HT| = 6$, $|OH| = 2 \text{ cm}$

$x^2 + 2^2 = 16^2$

$x^2 = 252 \Rightarrow x = 6\sqrt{7} \text{ cm}$

**Yanıt / Answer E**

**4.**




$|EF| = |MB| = 15 \text{ cm}$

$15^2 + 8^2 = |AB|^2$

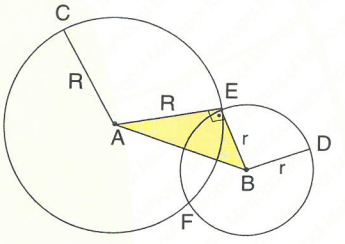
$|AB| = 17 \text{ cm}$

$|AB| = |AK| + |KL| + |LB|$

$17 = 5 + |KL| + 3 \Rightarrow |KL| = 9 \text{ cm}$

**Yanıt / Answer C**

**5.**




$|AB|^2 = r^2 + R^2 \Rightarrow 15^2 = r^2 + R^2$

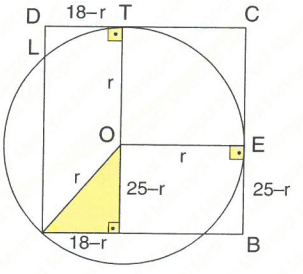
$(r + R)^2 = 21^2$

$r^2 + R^2 + 2R \cdot r = 21^2 \Rightarrow 2R \cdot r = 21^2 - 15^2$

$A(\widehat{ABE}) = \dfrac{R \cdot r}{2} = \dfrac{21^2 - 15^2}{4} = 54 \text{ cm}^2$

**Yanıt / Answer A**

**6.**

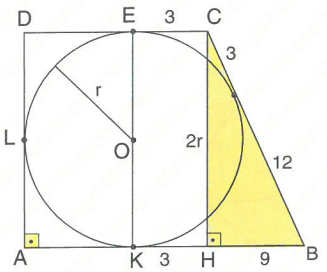



$r^2 = (25 - r)^2 + (18 - r)^2$

$r = 13 \text{ cm}$

**Yanıt / Answer B**

**7.**




$|CF| = |CE| = 3$ cm, $|FB| = |KB| = 12$ cm

$|KH| = 3$ cm $\Rightarrow |HB| = 9$ cm

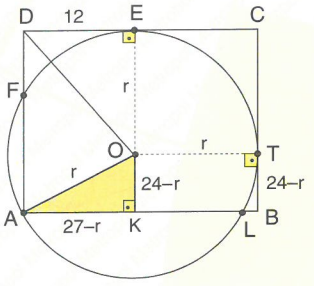
$|CB| = 12 + 3 = 15$ cm

$(2r)^2 = (15)^2 - (9)^2$

$r^2 = 36 \Rightarrow r = 6$ cm

**Yanıt / Answer D**

**8.**




$r^2 = (27 - r)^2 + (24 - r)^2$

$r = 15$ cm

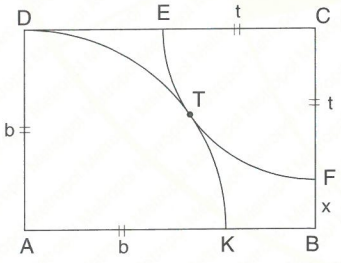
$|DE| = |AK| = 27 - r \Rightarrow |DE| = 12$ cm

$|DO|^2 = |EO|^2 + |ED|^2 = 15^2 + 12^2$

$|DO| = 3\sqrt{41}$ cm

**Yanıt / Answer D**

**9.**




$|EC| = |CF| = t \Rightarrow$

$x = b - t$

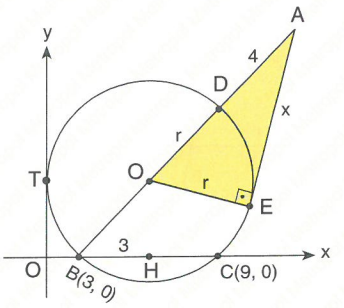
$|AD| = |AK| = b$

$|DE| + t = b + |KB| \Rightarrow |DE| - |KB| = b - t$

$12 = b - t \Rightarrow x = 12$ cm

**Yanıt / Answer E**

**10.**

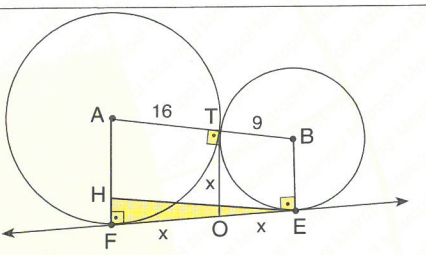



$x^2 = (4 + r)^2 - r^2$

$x^2 = (4 + 6)^2 - 6^2 \Rightarrow x^2 = 64 \Rightarrow x = 8$ cm

**Yanıt / Answer C**

**11.**




$|OT| = |OF| = x$, $|OT| = |OE| = x$

$|EH| = |AB| = 16 + 9 = 25$ cm

$|HF| = 16 - 9 = 7$ cm

$|EF|^2 = 25^2 - 7^2$

$|EF| = 24$ cm

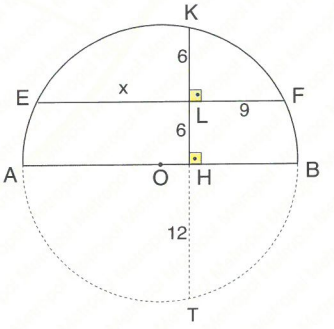
$|EF| = 2x = 24 \Rightarrow x = 12$ cm

**Yanıt / Answer B**

**12.** $|LE| \cdot |LF| = |LK| \cdot |LT|$

$9x = 6 \cdot (6 + 12)$

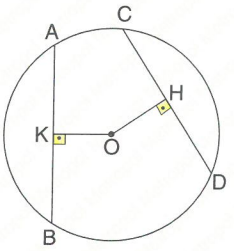
$x = 12$ cm




**Yanıt / Answer C**

**1.** O noktası şekildeki çemberin merkezidir. / The point O is center of the circle in the figure.

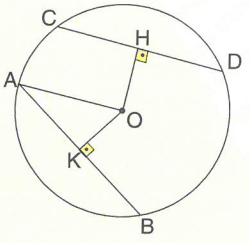
[OH] ⊥ [DC] ,
[OK] ⊥ [AB] ,
|AB| = 3(x + 3) cm,
|DC| = 4(x + 1) cm,
|OK| = |OH| = 9 cm
⇒ **Yarıçap / radius = ? cm**




A) 12 B) 13 C) 15 D) $9\sqrt{3}$ E) $12\sqrt{2}$

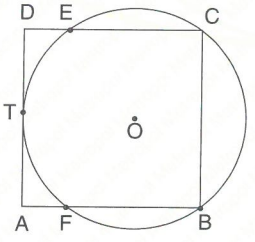
**2.** O noktaları şekildeki çemberin merkezidir.
The point O is center of the circle in the figure.

x ∈ Z
[OH] ⊥ [CD],
[OK] ⊥ [AB],
|AB| = 2(x + 5) cm,
|CD| = 2(3x – 1) cm,
|OH| = |OK|,
|OA| = 10 cm
⇒ **|OK| = ? cm**



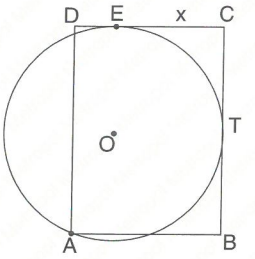

A) 8 B) 6 C) $3\sqrt{3}$ D) $2\sqrt{5}$ E) $3\sqrt{6}$

**3.** O noktası şekildeki çemberin merkezidir.
The point O is center of the circle in the figure.
Şekildeki çember T noktasın da teğettir.
ABCD bir karedir.
ABCD is a square.
|BC| = 16 cm
⇒ **yarıçap / radius = ? cm**



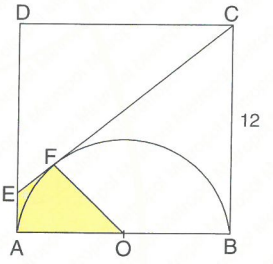

A) 6 B) 8 C) 9 D) 10 E) 12

**4.** ABCD dikdörtgeni şekildeki O merkezli çemberlere E ve T noktalarında teğettir.
|BC| = 18 cm
|AB| = 16 cm
⇒ **|EC| = x = ? cm**



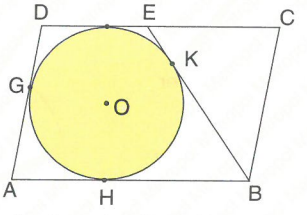

A) $6\sqrt{2}$ B) $8\sqrt{3}$ C) 9 D) 10 E) 12

**5.** O noktası şekildeki yarım çemberin merkezidir.
The point O is center of the circle in the figure.
ABCD bir kare,
[CE] F noktasında teğettir.
ABCD is a square,
[CE] is a tangent line.
|BC| = 12 cm
⇒ **A(AOFE) = ? cm²**




A) 36 B) $24\sqrt{3}$ C) $18\sqrt{3}$ D) 24 E) 18

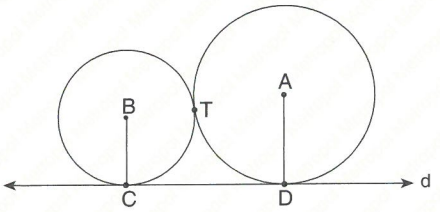
**6.**




Şekildeki o merkezli çember F, G, H, K noktalarında teğettir.
The point O is center of the circle in the figure.
ABCD bir paralelkenar, [DC], [DA], [AB] ve [EB] birer teğet doğrusudur.
ABCD is a parallelogram, [DC], [DA], [AB] and [EB] are tangent lines.
|AB| = 18 cm, |DE| = 12 cm ⇒ **|BE| + |BC| = ? cm**

A) 30 B) 28 C)26 D) 24 E) 20

**7.**



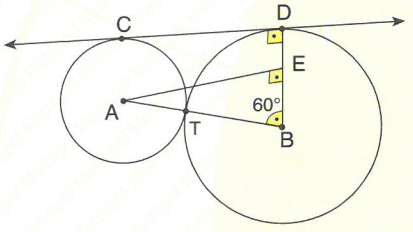

A ve B merkezli çemberler T noktasında birbirlerine, C ve B noktalarında da d doğrusuna teğettir.

[CD] is a tangent line.

$|AD| = 2\cdot|BC|$, $|CD| = 6\sqrt{2}$ cm $\Rightarrow$ **$|AB|$ = ? cm**

A) 6 B) 8 C) 9 D) 10 E) 12

**8.**




A ve B merkezli çemberler T noktasında birbirlerine C ve D noktalarında d doğrusunda teğettir.

[CD] bir teğet doğrusudur. / [CD] is a tangent line.

$|CD| = 8\sqrt{3}$ cm, $m(\widehat{TBD}) = 60^\circ$ $\Rightarrow$ **$|AB|$ = ? cm**

A) 12 B) 14 C) 16 D) 18 E) 20

**9.** Şekildeki A merkezli çember T noktasında teğettir.

The point A is center of the circle in the figure.

[BC] bir teğet doğrusudur.

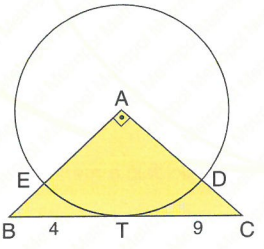
[BC] is a tangent line.

$[BA] \perp [AC]$,

$|BT| = 4$ cm,

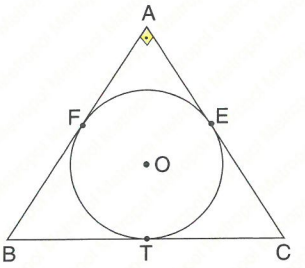
$|TC| = 9$ cm

$\Rightarrow$ **$A(\widehat{ABC})$ = ? cm$^2$**




A) 45 B) 42 C) 39 D) $26\sqrt{3}$ E) $20\sqrt{5}$

**10.**




Şekildeki O merkezli çember E, F, T noktalarında teğettir.

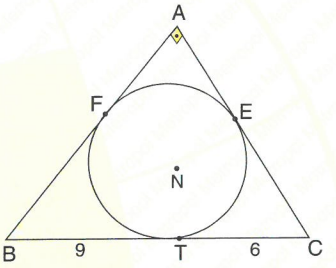
[AB], [AC], [BC] teğet doğrularıdır.

[AB], [AC], [BC] are the tangent lines.

$|BT| = 10$ cm, $|TC| = 15$ cm $\Rightarrow$ **$A(\widehat{ABC})$ = ? cm$^2$**

A) 72 B) 96 C) 108 D) 128 E) 150

**11.**




Şekildeki N merkezli çember E, F, T noktalarında teğettir.

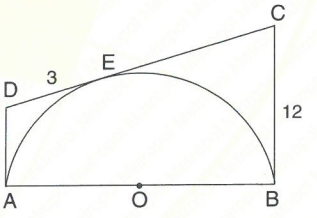
[AB], [AC], [BC] teğet doğrularıdır.

[AB], [AC], [BC] are the tangent lines.

$|BT| = 9$ cm, $|TC| = 6$ cm $\Rightarrow$ **$|AB|$ = ? cm**

A) $6\sqrt{6}$ B) $8\sqrt{3}$ C) $9\sqrt{2}$ D) 12 E) 13

**12.**




Şekildeki O merkezli yarım çember A, B, E noktalarında teğettir.

[AD], [DC], [CB] teğet doğrularıdır.

[AD], [DC], [CB] are the tangent lines.

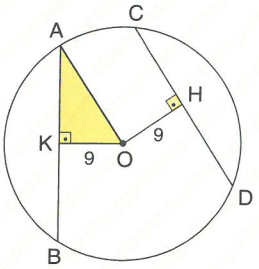
$|DE| = 3$ cm, $|BC| = 12$ cm $\Rightarrow$ **$A(ABCD)$ = ? cm$^2$**

A) $72\sqrt{3}$ B) $54\sqrt{6}$ C) 90 D) 108 E) $90\sqrt{3}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | B | D | D | E | A | C | C | C | E | D | C |

**1.**




$|OK| = |OH| \Rightarrow |AB| = |DC|$

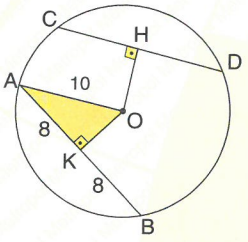
$3x + 9 = 4x + 4 \Rightarrow x = 5$ cm

$x = 5 \Rightarrow |AB| = 24$ cm $\Rightarrow |AK| = 12$ cm

$r = |OA| = \sqrt{12^2 + 9^2} = 15$ cm

**Yanıt / Answer C**

**2.**




$|OH| = |OK| \Rightarrow |AB| = |CD|$

$2(x + 5) = 2(3x - 1) \Rightarrow x = 3$ cm

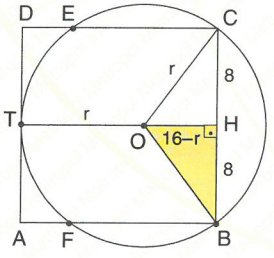
$x = 3 \Rightarrow |AB| = 16$ cm $\Rightarrow |AK| = 8$ cm

$|OK|^2 = 10^2 - 8^2 = 36$

$|OK| = 6$ cm

**Yanıt / Answer B**

**3.**



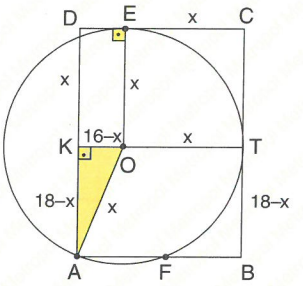

$\left.\begin{array}{l}[OH] \perp [CB] \\ |OH| = 16 - r\end{array}\right\} \Rightarrow$

$r^2 = (16 - r)^2 + 8^2$

$32r = 16^2 + 8^2 \Rightarrow r = 10$ cm

**Yanıt / Answer D**

**4.**




$|OA| = x$ cm

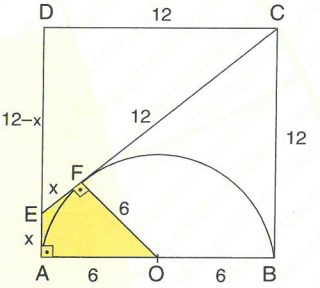
$|OK| = (16 - x)$ cm, $|AK| = (18 - x)$ cm

$x^2 = (16 - x)^2 + (18 - x)^2$

$x = 10$ cm

**Yanıt / Answer D**

**5.**




$\perp \widehat{DCE} \Rightarrow$

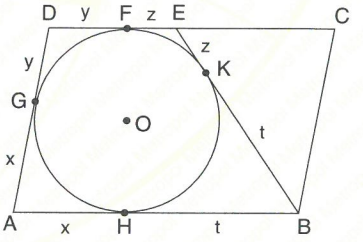
$(12 + x)^2 = 12^2 + (12 - x)^2$

$48x = 12^2 \Rightarrow x = 3$ cm

$A(AOFE) = 3 \cdot 6 = 18$ cm$^2$

**Yanıt / Answer E**

**6.**




$|AB| = 18 \Rightarrow x + t = 18$ cm

$|DE| = 12 \Rightarrow y + z = 12$ cm

$|BE| = z + t$

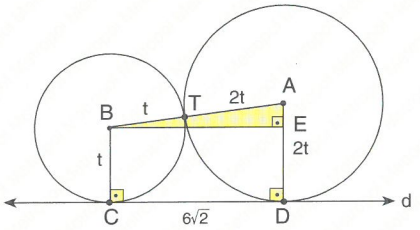
ABCD bir paralelkenardır. / ABCD is a parallelogram.

$|BC| = |AD| = y + x$

$|BE| + |BC| = z + t + y \cdot + x \Rightarrow 18 + 12 = 30$ cm

**Yanıt / Answer A**

**7.**




$|AB| = t + 2t = 3t$

$|AE| = |AD| - |BC| = 2t - t = t$

$|BE| = |CD| = 6\sqrt{2}$ cm

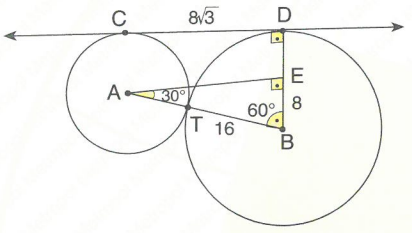
$|AB|^2 = |CD|^2 + |AE|^2$

$9t^2 = 72 + t^2 \Rightarrow 8t^2 = 72 \Rightarrow t^2 = 9 \Rightarrow t = 3$ cm

$|AB| = 3t = 3 \cdot 3 = 9$ cm

**Yanıt / Answer C**

**8.**



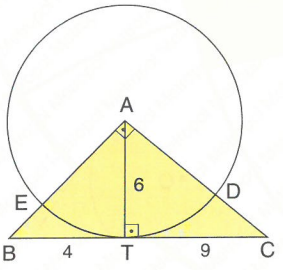

$\left.\begin{array}{l} \perp \widehat{AEB} \\ [CD] \,//\, [AE] \end{array}\right\} \Rightarrow$

$|CD| = |AE| = 8\sqrt{3}$ cm

$\widehat{AEB}$ (30°, 60°, 90°) $\Rightarrow |AB| = 16$ cm

**Yanıt / Answer C**

**9.**



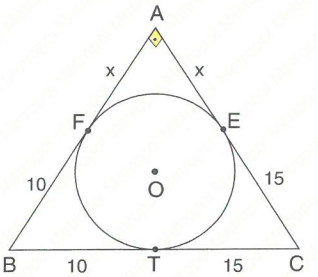

$|AT|^2 = |BT| \cdot |TC|$ [Euclid ]

$|AT|^2 = 4 \cdot 9 \Rightarrow |AT| = 6$ cm

$A(\widehat{ABC}) = \dfrac{6 \cdot 13}{2} = 39$ cm$^2$

**Yanıt / Answer C**

**10.**




$\left.\begin{array}{l} |AF| = |AE| = x \\ \perp \widehat{ABC} \end{array}\right\} \Rightarrow$

$(x + 10)^2 + (x + 15)^2 = 25^2$

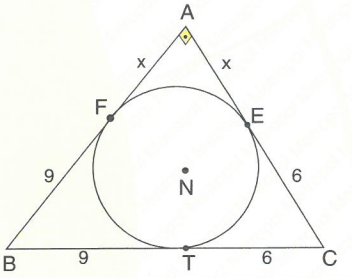
$2x^2 + 50x - 300 = 0 \Rightarrow x^2 + 25x - 150 = 0$

$(x - 5) \cdot (x + 30) = 0 \Rightarrow x = 5$ cm

$A(\widehat{ABC}) = \dfrac{15 \cdot 20}{2} = 150$ cm$^2$

**Yanıt / Answer E**

**11.**




$\left.\begin{array}{l} |AF| = |AE| = x \\ \perp \widehat{ABC} \end{array}\right\} \Rightarrow$

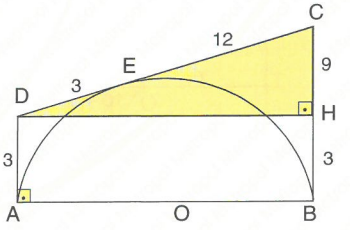
$(x + 9)^2 + (x + 6)^2 = 15^2 \Rightarrow 2x^2 + 30x - 108 = 0$

$x^2 + 15x - 54 = 0 \Rightarrow (x - 3) \cdot (x + 18) = 0$

$x = 3 \Rightarrow |AB| = 12$ cm

**Yanıt / Answer D**

**12.**



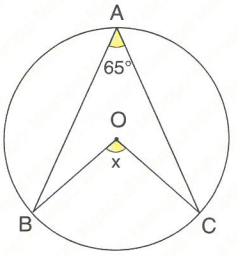

$|CH| = 12 - 3 = 9$ cm

$|DH|^2 = 15^2 - 9^2 \Rightarrow |DH| = 12$ cm

$A(ABCD) = \dfrac{12 \cdot (3 + 12)}{2} = 90$ cm$^2$

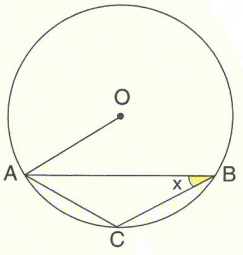
**Yanıt / Answer C**

**1.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
$m(\widehat{BAC}) = 65°$
$\Rightarrow$ **$m(\widehat{BOC}) = x = ?$**



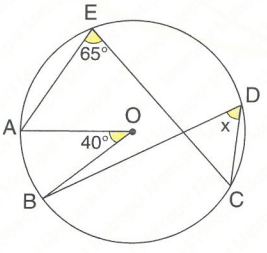

A) 90° B) 105° C) 115° D) 125° E) 130°

**2.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
$|AC| = |OA|$
$\Rightarrow$ **$m(\widehat{ABC}) = x = ?$**



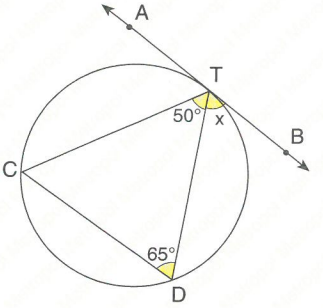

A) 20° B) 25° C) 30° D) 40° E) 45°

**3.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
$m(\widehat{AEC}) = 65°$,
$m(\widehat{AOB}) = 40°$
$\Rightarrow$ **$m(\widehat{BDC}) = x = ?$**



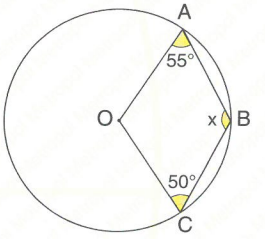

A) 30° B) 35° C) 40° D) 45° E) 50°

**4.** [AB] teğet T noktasında teğet
[AB] is a tangent,
$m(\widehat{CTD}) = 50°$,
$m(\widehat{TDC}) = 65°$
$\Rightarrow$ **$m(DTB) = x = ?$**



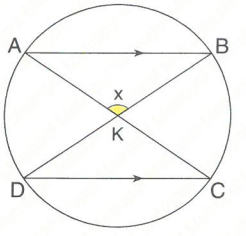

A) 55° B) 60° C) 65° D) 70° E) 75°

**5.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
$m(\widehat{OAB}) = 55°$,
$m(\widehat{OCB}) = 50°$
$\Rightarrow$ **$m(\widehat{ABC}) = x = ?$**



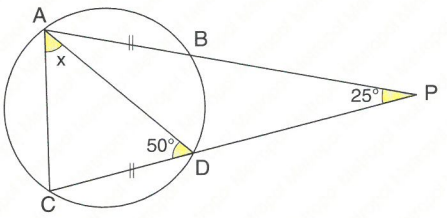

A) 105° B) 110° C) 115° D) 120° E) 125°

**6.** [AB] // [CD],
$\widehat{IACI} = 55°$
$\Rightarrow$ **$m(\widehat{AKB}) = x = ?$**




A) 120° B) 125° C) 130° D) 135° E) 140°

**7.**

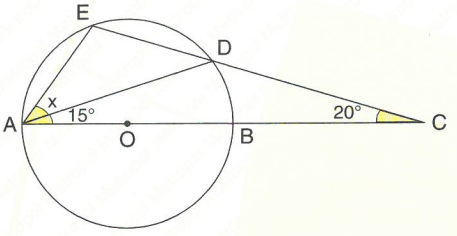



IABI = ICDI, m($\widehat{ADC}$) = 50°, m($\widehat{APC}$) = 25°

⇒ **m($\widehat{CAD}$) = x = ?**

A) 50° B) 52,5° C) 55° D) 65° E) 62,5°

**8.**



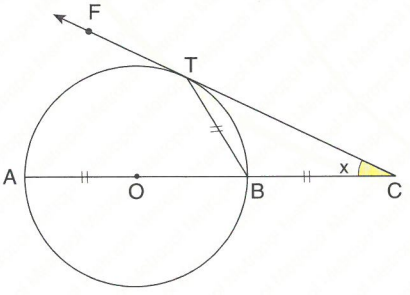

O noktası şekildeki çemberin merkezidir.

Point O is center of the circle in the figure.

m($\widehat{DAC}$) = 15°, m($\widehat{ACE}$) = 20° ⇒ **m($\widehat{EAD}$) = x = ?**

A) 20° B) 25° C) 30° D) 35° E) 40°

**9.**




O noktası şekildeki çemberin merkezidir.

Point O is center of the circle in the figure.

IAOI = IBCI = ITBI ⇒ **m($\widehat{TCB}$) = x = ?**

A) 22,5° B) 25° C) 27,5° D) 30° E) 35°

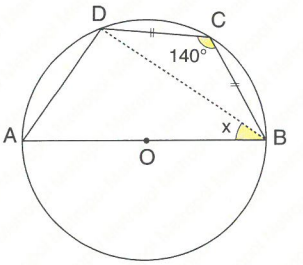
**10.** O noktası şekildeki çemberin merkezidir.

Point O is center of the circle in the figure.

IBCI = ICDI,

m($\widehat{BCD}$) = 140°

⇒ **m($\widehat{DBA}$) = x = ?**




A) 30° B) 35° C) 40° D) 45° E) 50°

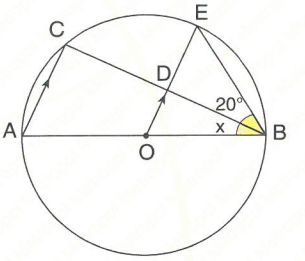
**11.** O noktası şekildeki çemberin merkezidir.

Point O is center of the circle in the figure.

[OE] // [AC],

m($\widehat{CBE}$) = 20°

⇒ **m($\widehat{CBA}$) = x = ?**



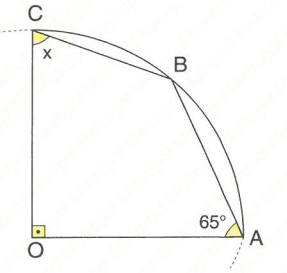

A) 35° B) 40° C) 45° D) 50° E) 55°

**12.** O noktası şekildeki çemberin merkezidir.

Point O is center of the circle in the figure.

m($\widehat{DAB}$) = 65°

⇒ **m($\widehat{OCB}$) = x = ?**

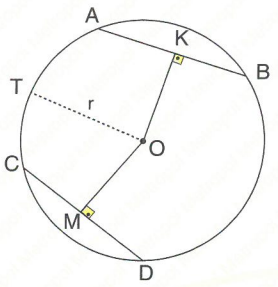



A) 55° B) 60° C) 65° D) 70° E) 75°

**YANITLAR / ANSWERS**

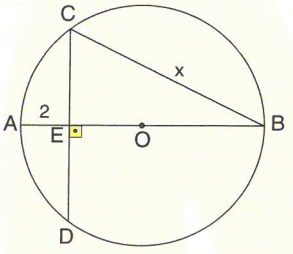
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | C | D | C | A | B | B | E | D | E | D | D |

**1.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
[OK] ⊥ [AB],
[OM] ⊥ [CD],
IABI = ICDI = 8 cm,
IOKI = 3x – 2,
IOMI = x + 2
⇒ **IOTI = r = ? cm**



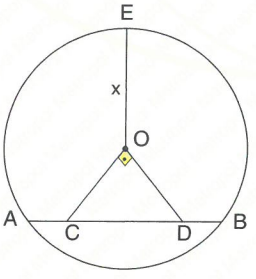

A) 3 B) 4 C) 5 D) $3\sqrt{2}$ E) $4\sqrt{2}$

**2.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
[AB] ⊥ [CD],
ICDI = 8 cm,
IAEI = 2 cm
⇒ **ICBI = x = ? cm**



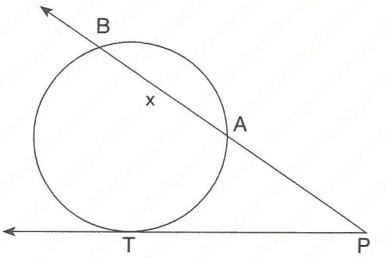

A) $4\sqrt{2}$ B) $4\sqrt{3}$ C) $4\sqrt{5}$ D) 8 E) 10

**3.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
IACI = IDBI = 2 cm,
ICDI = 12 cm
⇒ **IOEI = x = ? cm**



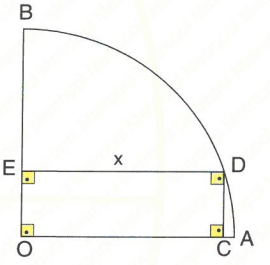

A) 8 B) 10 C) 12 D) 14 E) 16

**4.** Şekildeki O merkezli çember [PT ye T noktasında teğettir.
IPTI = 6 cm,
IAPI = 4 cm
⇒ **IABI = x = ? cm**



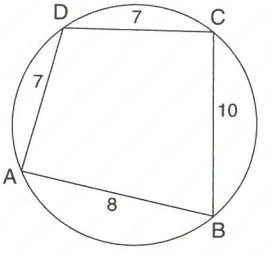

A) 4 B) 5 C) 6 D) 7 E) 8

**5.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
IOEI = 5 cm,
IEBI = 8 cm
⇒ **IEDI = x = ? cm**



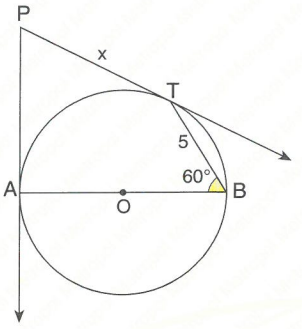

A) 8 B) 9 C) 10 D) 11 E) 12

**6.** IADI = 7 cm,
IDCI = 7 cm,
IABI = 8 cm,
ICBI = 10 cm
⇒ **A(ABCD) = ? cm²**



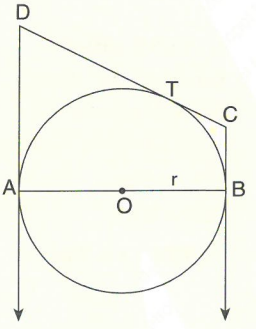

A) 18 B) $20\sqrt{3}$ C) 28 D) $36\sqrt{3}$ E) 48

**7.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
$m(\widehat{TBA}) = 60°$,
IBTI = 5 cm,
⇒ **IPTI = x = ? cm**



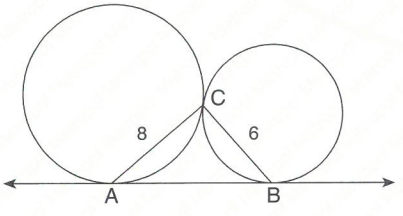

A) $5\sqrt{3}$ B) $6\sqrt{3}$ C) 8 D) 9 E) 10

**8.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
ICBI = 3 cm,
IADI = 12 cm
⇒ **IOBI = r = ? cm**




A) 4 B) 5 C) 6 D) 7 E) 8

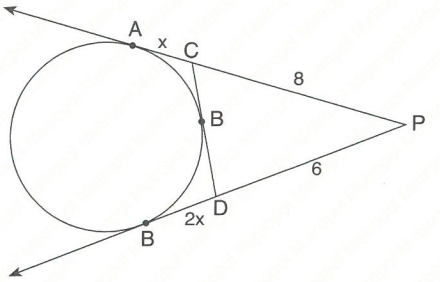
**9.**




ICAI = 8 cm, ICBI = 6 cm ⇒ **IABI = ? cm**

A) 9 B) 10 C) 11 D) 12 E) 13

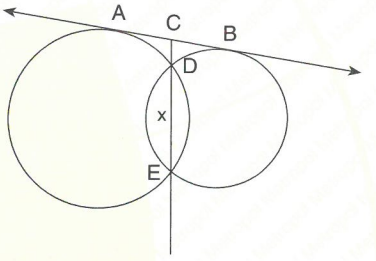
**10.**




IACI = x, IBDI = 2x, IDPI = 6 cm, ICPI = 8 cm
⇒ **ICDI = ? cm**

A) 3 B) 4 C) 5 D) 6 E) 7

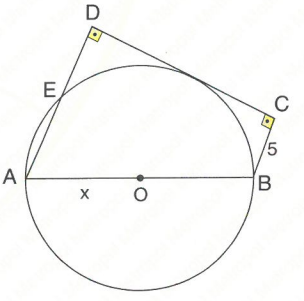
**11.**




IABI = 8 cm, ICDI = 2 cm ⇒ **IDEI = x = ? cm**

A) 5 B) 6 C) 7 D) 8 E) 9

**12.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
[AD] ⊥ [DC],
[BC] ⊥ [DC],
IBCI = 5 cm,
IADI = 11 cm
⇒ **IAOI = x = ? cm**




A) 6 B) 7 C) 8 D) 9 E) 10

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | C | B | B | E | D | A | C | B | D | B | C |

# BÖLÜM CHAPTER 12

## TARİHSEL NOT / HISTORICAL NOTE

### Carl Friedrich Gauss (Gaus) [1777 – 1855]

Alman matematikçi ve bilim insanı. Katkıda bulunduğu alanlardan bazıları; sayılar kuramı, analiz, diferansiyel geometri, jeodezi, elektrik, manyetizma, astronomi ve optiktir. "Matematikçilerin prensi" ve "antik çağlardan beri yaşamış en büyük matematikçi" olarak da anılan Gauss, matematiğin ve bilimin pek çok alanına etkisini bırakmıştır ve tarihin en nüfuzlu matematikçilerinden biri olarak kabul edilir.

German mathematician and scientist. Some of the areas where he participated are numbers theory, analysis, differential geometry, geodesy, electricity, magnetism, astronomy and optics. Gauss, also known as "the prince of mathematicians" and "the greatest mathematician since antiquity period", has influenced many areas of mathematics and science and is considered one of the most influential mathematicians in history.

# ÇEMBERDE KUVVET, ÇEVRE ve ALAN
# POWER, CIRCUMFERENCE and AREA in a CIRCLE

**Bu bölüm 48 çözümlü test sorusu ve 36 test sorusu içermektedir.**

**This chapter includes 48 test questions with solutions and 36 test questions.**

**BÖLÜM / CHAPTER 12**

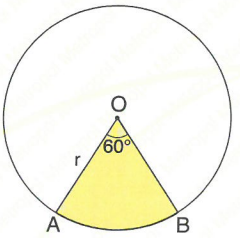
**ÇEMBERDE KUVVET, ÇEVRE VE ALAN / POWER, CIRCUMFERENCE and AREA in a CIRCLE**

BÖLÜM 12 CHAPTER

# ÇEMBERDE KUVVET, ÇEVRE VE ALAN
# POWER, CIRCUMFERENCE and AREA in a CIRCLE

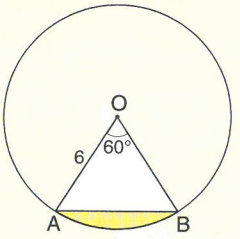


**1.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
$m(\widehat{AOB}) = 60°$,
$TA / SA = 4\pi\ cm^2$
$\Rightarrow$ **$|OA| = r = ?$ cm**



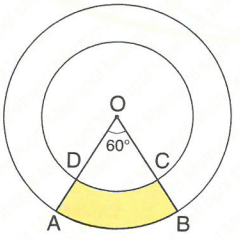

A) 2 B) $2\sqrt{2}$ C) $2\sqrt{3}$ D) 4 E) $2\sqrt{6}$

**2.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
$|OA| = 6$ cm,
$m(\widehat{AOB}) = 60°$
$\Rightarrow$ **$TA / SA = ?\ cm^2$**



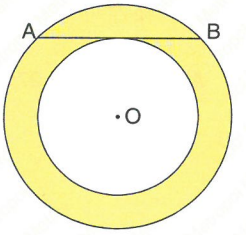

A) $2\pi - 3\sqrt{3}$ B) $2(2\pi - 3\sqrt{3})$ C) $3(2\pi - 3\sqrt{3})$
D) $4(2\pi - 3\sqrt{3})$ E) $4\pi - 3\sqrt{3}$

**3.** $m(\widehat{COD}) = 60°$,
$\frac{|OC|}{|CA|} = 2$ cm,
$TA / SA = 5\pi\ cm^2$
$\Rightarrow$ **$|OC| = ?$ cm**



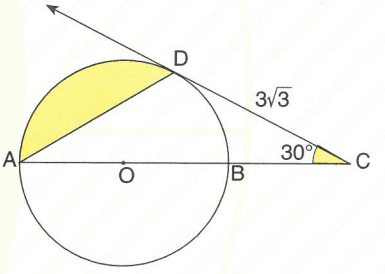

A) $\sqrt{3}$ B) $\sqrt{6}$ C) $2\sqrt{3}$ D) $2\sqrt{6}$ E) $3\sqrt{3}$

**4.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
$|AB| = 20$ cm
$\Rightarrow$ **$TA / SA = ?\ cm^2$**



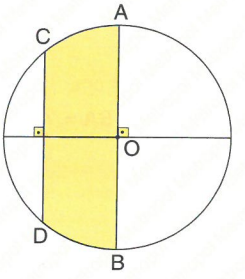

A) $200\pi$ B) $150\pi$ C) $100\pi$ D) $20\pi$ E) $10\pi$

**5.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
$m(\widehat{ACD}) = 30°$,
$|DC| = 3\sqrt{3}$ cm
$\Rightarrow$ **$TA / SA = ?\ cm^2$**




A) $3(\pi - \frac{3\sqrt{2}}{4})$ B) $3(\pi - \frac{3\sqrt{3}}{2})$ C) $2(\pi - \frac{3\sqrt{3}}{4})$
D) $2(\pi - \frac{3\sqrt{3}}{2})$ E) $\pi - \frac{3\sqrt{3}}{2}$

**6.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
$|AO| = 8$ cm,
$|DC| = 8\sqrt{2}$ cm
**$TA / SA = ?\ cm^2$**




A) $4(2 + \pi)$ B) $8(2 + \pi)$ C) $16(2 + \pi)$
D) $4(4 + \pi)$ E) $8(4 + \pi)$

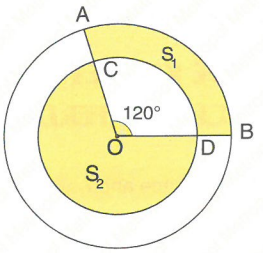
**7.** O noktası şekildeki çemberin merkezidir.

Point O is center of the circle in the figure.

$m(\widehat{AOB}) = 120°$,

$|AO| = 9$ cm,

$S_1 = S_2 \Rightarrow$ **$S_1 + S_2 = ?$**




A) $18\pi$ B) $27\pi$ C) $36\pi$ D) $45\pi$ E) $54\pi$

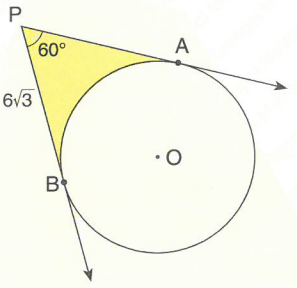
**8.** O noktası şekildeki çemberin merkezi, [PA ve [PB teğettir.

Point O is center of the circle in the figure, [PA and [PB are the tangent lines.

$m(\widehat{APB}) = 60°$,

$|PB| = 6\sqrt{3}$ cm

$\Rightarrow$ **TA / SA = ? cm²**



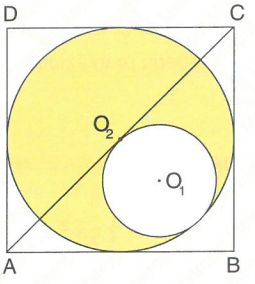

A) $6(3\sqrt{3} - \pi)$ B) $6(3\sqrt{3} - 2\pi)$ C) $12(3\sqrt{3} - 2\pi)$ D) $12(3\sqrt{3} - \pi)$ E) $36\sqrt{3}$

**9.** ABCD bir karedir.

ABCD is a square.

$|AB| = 4$ cm

$\Rightarrow$ **TA / SA = ? cm²**




A) $2\pi$ B) $3\pi$ C) $4\pi$ D) $5\pi$ E) $6\pi$

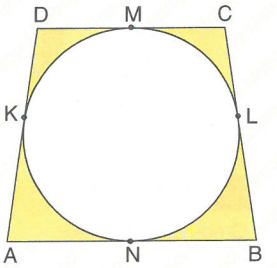
**10.** Şekildeki ABCD dörtgeni bir ikizkenar yamuktur.

ABCD is an isosceles trapezoid in the figure.

$|DC| = 4$ cm,

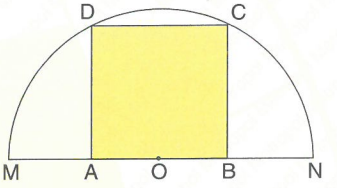
$|AB| = 16$ cm

$\Rightarrow$ **TA / SA = ? cm²**




A) $80 + 16\pi$ B) $90 - 16\pi$ C) $80 - 16\pi$ D) $80 - 8\pi$ E) $80 - 2\sqrt{2}\pi$

**11.**

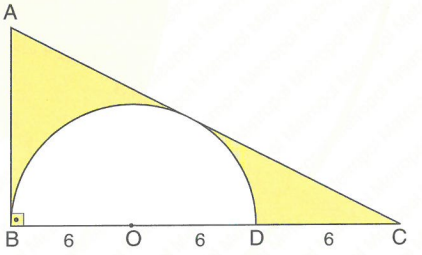



ABCD bir karedir. / ABCD is a square.

$A(ABCD) = 20$ cm² $\Rightarrow$ **$|MN| = ?$ cm**

A) $\sqrt{5}$ B) $2\sqrt{5}$ C) $3\sqrt{5}$ D) $4\sqrt{5}$ E) 10

**12.**




O noktası şekildeki yarım çemberin merkezidir.

The point O is center of the semicircle in the figure.

$[AB] \perp [BC]$, $|BO| = |OD| = |DC| = 6$ cm

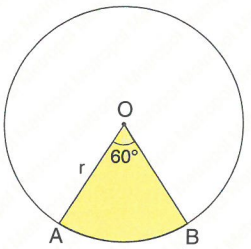
$\Rightarrow$ **TA / SA = ? cm²**

A) $9(3\sqrt{3} - \pi)$ B) $12(3\sqrt{3} - \pi)$ C) $15(3\sqrt{3} - \pi)$ D) $18(3\sqrt{3} - \pi)$ E) $24(3\sqrt{3} - \pi)$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | C | D | C | A | C | C | D | B | C | E | D |

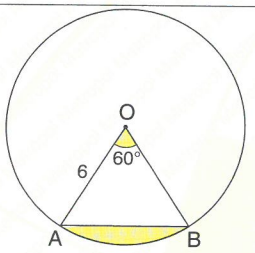
**1.**




$$\frac{\pi r^2 \cdot 60°}{360°} = 4\pi \Rightarrow r^2 = 24 \Rightarrow r = 2\sqrt{6} \text{ cm}$$

Yanıt / Answer **E**

**2.**




$$A(\widehat{OAB}) = \frac{\sqrt{3}}{4} \cdot 6^2 = 9\sqrt{3} \text{ cm}^2$$

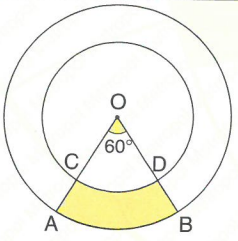
$$TA/SA = \frac{\pi \cdot 6^2}{360°} \cdot 60° - 9\sqrt{3}$$

$$= 6\pi - 9\sqrt{3}$$

$$= 3(2\pi - 3) \text{ cm}^2$$

Yanıt / Answer **C**

**3.**




$|OC| = 2t$, $|OA| = 3t$

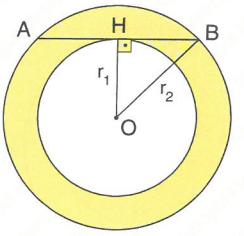
$$TA/SA = \frac{\pi \cdot (3t)^2}{6} - \frac{\pi \cdot (2t)^2}{6} = 5\pi \text{ cm}^2$$

$$\frac{5\pi t^2}{6} = 5\pi \Rightarrow t^2 = 6 \Rightarrow t = \sqrt{6}$$

$|OC| = 2\sqrt{6}$ cm

Yanıt / Answer **D**

**4.**



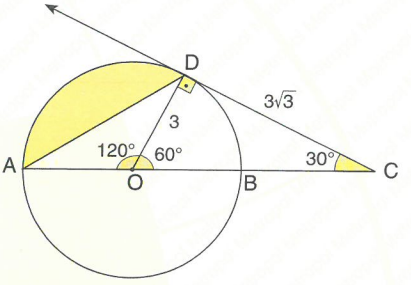

$|OH| = r_1$, $|OB| = r_2$

$\perp \widehat{GHB} \Rightarrow r_2^2 - r_1^2 = 10^2$

$\Rightarrow TA / SA = \pi(r_2^2 - r_1^2) = 100\pi \text{ cm}^2$

Yanıt / Answer **C**

**5.**




$r = |OA| = |OD| = 3$ cm

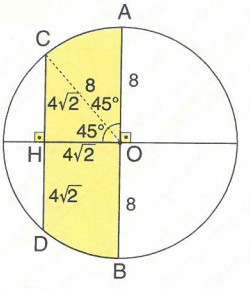
$$A(AOD) = \frac{3 \cdot 3 \cdot \sin 120°}{2} = \frac{9\sqrt{3}}{4} \text{ cm}^2$$

$$\overset{\triangledown}{AOD} = \frac{3^2 \cdot \pi \cdot 120°}{360°} = 3\pi$$

$$TA/SA = 3\pi - \frac{9\sqrt{3}}{4} = 3\left(\pi - \frac{3\sqrt{2}}{4}\right) \text{cm}^2$$

Yanıt / Answer **A**

**6.**



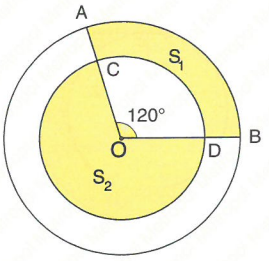

$$A(\widehat{HOC}) = \frac{4\sqrt{2} \cdot 4\sqrt{2}}{2} = 16 \text{ cm}^2$$

$$A(\overset{\triangledown}{COA}) = \frac{8^2 \cdot \pi \cdot 45}{360} = 8\pi \text{ cm}^2$$

$\Rightarrow TA / SA = 2(8\pi + 16) = 16(\pi + 2) \text{ cm}^2$

Yanıt / Answer **C**

**7.**




$|OD| = r$, $|OA| = R = 9$ cm

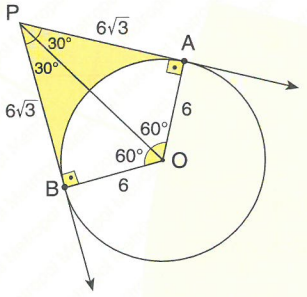
$$\left.\begin{array}{l} S_2 = \dfrac{2\cdot\pi\cdot r^2}{3} \\ S_1 = \dfrac{\pi\cdot R^2}{3} - \dfrac{\pi\cdot r^2}{3} = 27\pi - \dfrac{\pi\cdot r^2}{3} \end{array}\right\}$$

$S_1 = S_2 \Rightarrow r^2 = 27$

$S_1 = 18\pi = S_2 \Rightarrow S_1 + S_2 = 36\pi$ cm$^2$

**Yanıt / Answer C**

**8.**



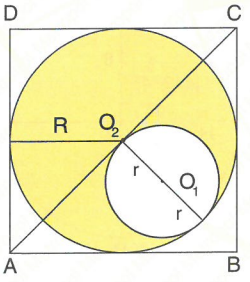

$A(PBOA) = 2\cdot\dfrac{6\cdot 6\sqrt{3}}{2} = 36\sqrt{3}$ cm$^2$

$A(\widehat{BOA}) = \dfrac{\pi\cdot 6^2\cdot 120°}{360°} = 12\pi$ cm$^2$

TA / SA $= 36\sqrt{3} - 12\pi = 12(3\sqrt{3} - \pi)$ cm$^2$

**Yanıt / Answer D**

**9.**

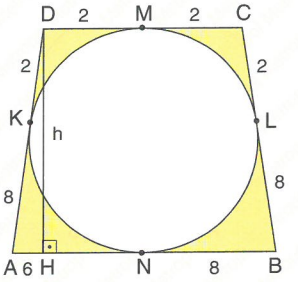



$R = \dfrac{4}{2} = 2$ cm, $2r = 2 \Rightarrow r = 1$ cm

TA / SA $= \pi\cdot 2^2 - \pi\cdot 1^2 = 3\pi$ cm$^2$

**Yanıt / Answer B**

**10.**




$\perp \widehat{DAH} \Rightarrow |AH| = \dfrac{16-4}{2} = 6$ cm

$h^2 = 10^2 - 6^2$ [ Pythagor ]

$h = 8$ cm

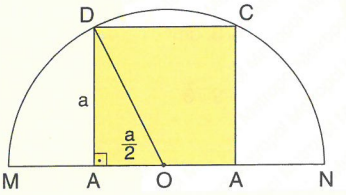
$h = 2r = 8 \Rightarrow r = 4$ cm

taralı alan / the shaded area $= \dfrac{(16+4).8}{2} - \pi\cdot 4^2$

$= 80 - 16\pi$ cm$^2$

**Yanıt / Answer C**

**11.**



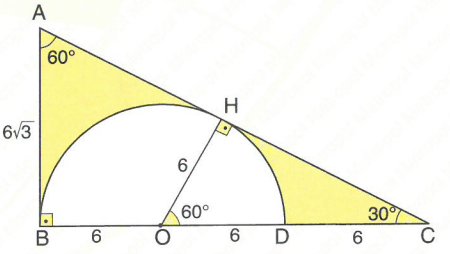

$a^2 = 20 \Rightarrow a = 2\sqrt{5}$ cm

$|DO|^2 = (2\sqrt{5})^2 + (\sqrt{5})^2 = 25 \Rightarrow |DO| = 5$ cm

$|MN| = 10$ cm

**Yanıt / Answer E**

**12.**



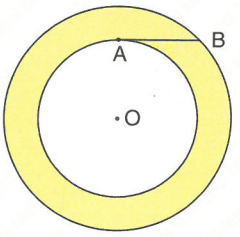

$$\left.\begin{array}{l} [OH] \perp [AC] \\ m(C) = 30° \end{array}\right\} \Rightarrow$$

TA/SA $= \dfrac{6\sqrt{3}\cdot 18}{2} - \dfrac{1}{2}\cdot\pi\cdot 6^2$

$= 54\sqrt{3} - 18\pi = 18(3\sqrt{3} - \pi)$ cm$^2$

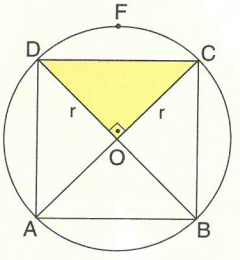
**Yanıt / Answer D**

**1.** O noktası şekildeki çemberlerin merkezidir.
Point O is center of the circle in the figure.
IABI = 3 cm
⇒ **Taralı alan / The shaded area = ? cm²**



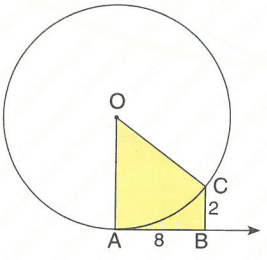

A) $3\pi$ B) $6\pi$ C) $9\pi$ D) $12\pi$ E) $15\pi$

**2.** ABCD bir karedir.
ABCD is a square.
$m(\widehat{CFD}) = 2\pi$
⇒ **Taralı alan / The shaded area = ? cm²**



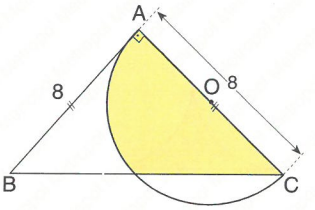

A) 2 B) 4 C) 6 D) 8 E) 10

**3.** [AB, çembere A noktasında teğettir.
[AB is tangent to circle at the point A.
IABI = 8 cm,
IBCI = 2 cm
⇒ **Taralı alan / The shaded area = ? cm²**




A) 40 B) 54 C) 63 D) 72 E) 76

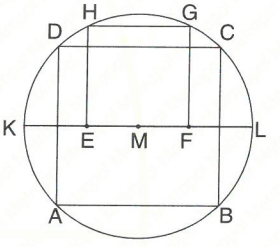
**4.**




O noktası şekildeki çemberin merkezidir.
the point O is center of the circle in the figure.
[AB] ⊥ [AC], IABI = IACI = 8 cm
⇒ **Taralı alan / The shaded area = ? cm²**

A) $16 + 8\pi$ B) $12 + 8\pi$ C) $8 + 8\pi$ D) $8 + 4\pi$ E) $4 + 4\pi$

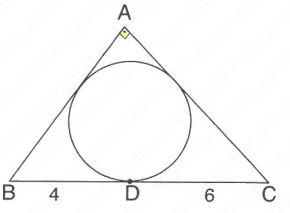
**5.** M noktası şekildeki çemberin merkezi, EFGH ve ABCD birer karedir.
Point M is center of the circle in the figure, EFGH and ABCD are squares.




$\Rightarrow \dfrac{A(EFGH)}{A(ABCD)} = ?$

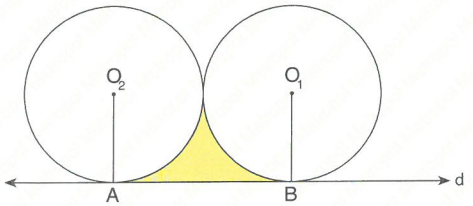
A) $\frac{1}{2}$ B) $\frac{2}{3}$ C) $\frac{2}{5}$ D) $\frac{3}{5}$ E) $\frac{3}{4}$

**6.** [AB] ⊥ [AC],
IBDI = 4 cm,
IDCI = 6 cm
⇒ **$A(\widehat{ABC})$ = ? cm²**




A) 36 B) 24 C) $12\sqrt{3}$ D) 48 E) $10\sqrt{5}$

**7.**




$O_1$ $O_2$ noktaları şekildeki çemberlerin merkezleridir. d doğrusuna A ve B noktalarında teğetir.

$|O_1A| = |O_2B| = 6$ cm

⇒ **Taralı alan /** The shaded area = **? cm²**

A) $18(4-\pi)$ B) 54 C) $36(2-\pi)$ D) 18 E) $18(2-\pi)$

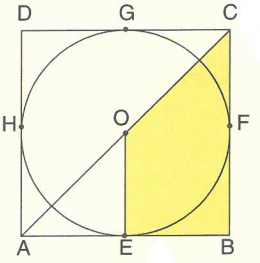
**8.** O noktası şekildeki çemberin merkezi, ABCD bir karedir.

Point O is center of the circle in the figure, ABCD is a square

şekildeki taralı alan

The shaded area = 24 cm²

**A(ABCD) = ? cm²**




A) 16 B) 32 C) 48 D) 64 E) 80

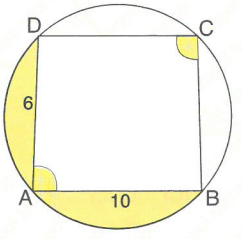
**9.** O noktası şekildeki çemberin merkezidir.

Point O is center of the circle in the figure.

$m(\widehat{DAB}) = m(\widehat{DCB})$,

$|AD| = 6$ cm,

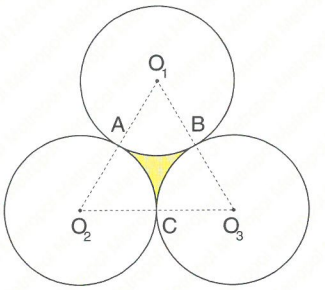
$|AB| = 10$ cm




⇒ **Taralı alan /** The shaded area **= ? cm²**

A) $17\pi - 15$ B) $17\pi - 20$ C) $17\pi - 30$ D) $17\pi - 60$ E) $2(17\pi - 15)$

**10.**




$O_1$, $O_2$ ve $O_3$ noktaları şekildeki çemberlerin merkezleridir.

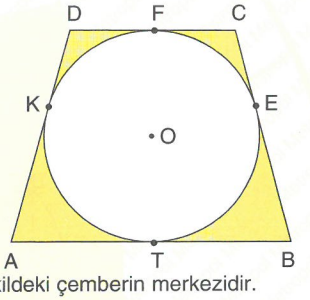
$O_1$, $O_2$ and $O_3$ are center of the circles in the figure.

$|O_1A| = |O_2A| = |O_2C| = |O_3C| = |O_1B| = |O_3B| = 2$ cm

⇒ **Taralı alan /** The shaded area = **? cm²**

A) $2(2\sqrt{3}-\pi)$ B) $4\sqrt{3}-\pi$ C) $2\sqrt{3}-2\pi$ D) $2\sqrt{3}-\pi$ E) $2\sqrt{3}-4\pi$

**11.**




O noktası şekildeki çemberin merkezidir.

ABCD bir ikizkenar yamuktur.

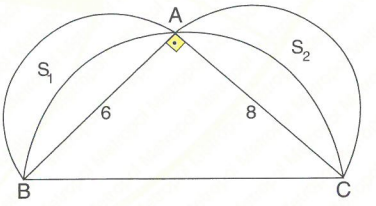
ABCD is a isosceles trapezoid.

$[AB] // [DC]$, $|AD| = \frac{25}{2}$ cm, $|DC| = 9$ cm

⇒ **Taralı alan /** The shaded area **= ? cm²** ($\pi = 3$)

A) 36 B) 42 C) 48 D) 56 E) 72

**12.**




[AB], [BC], [AC] şekildeki yarım çemberlerin çaplarıdır.

[AB], [BC] and [AC] are diameter of semcircles in the figure.

$|AB| = 6$ cm, $|AC| = 8$ cm

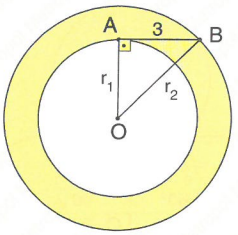
⇒ **$S_1 + S_2$ = ? cm²**

A) 48 B) 36 C) 28 D) 24 E) 12

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | D | E | D | C | B | A | D | C | A | B | D |

**1.**




$$\left.\begin{array}{l} |OA| = r_1,\ |OB| = r_2 \\ \perp \widehat{AOB} \end{array}\right\} \Rightarrow$$

$r_2^2 - r_1^2 = 3^2$

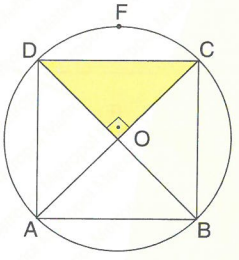
$TA / SA = \pi r_2^2 - \pi r_1^2$

$= \pi(r_2^2 - r_1^2)$

$= \pi \cdot 3^2 = 9\pi \text{ cm}^2$

**Yanıt / Answer C**

**2.**




$m(\widehat{CFD}) = \dfrac{(2\pi r) \cdot 90^2}{360°} = 2\pi \Rightarrow r = 4 \text{ cm}$

$TA/SA = \dfrac{4 \cdot 4}{2} = 8 \text{ cm}^2$

**Yanıt / Answer D**

**3.** $|OC| = r$

$|EC|^2 + |EO|^2 = |OC|^2$

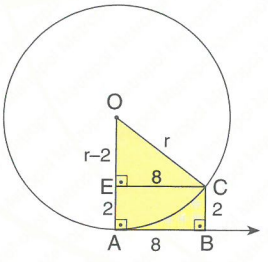
$8^2 + (r-2)^2 = r^2$

$64 + r^2 - 4r + 4 = r^2$

$68 = 4r$

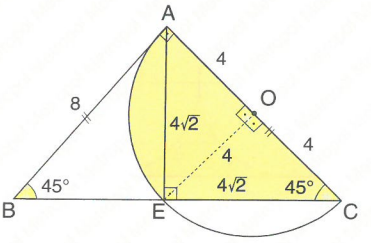
$r = 17 \text{ cm}$

$TA/SA = \dfrac{(17+2) \cdot 8}{2} = 76 \text{ cm}^2$




**Yanıt / Answer E**

**4.**




$|AE| = |EC| = 4\sqrt{2} \text{ cm}$

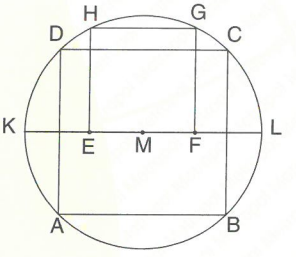
$A(\overset{\triangle}{AOE}) = \dfrac{\pi \cdot 4^2 \cdot 90°}{360°} = 4\pi \text{ cm}^2$

$A(\widehat{EOC}) = \dfrac{4 \cdot 4}{2} = 8 \text{ cm}^2$

$TA/SA = 4\pi + 8 \text{ cm}^2$

**Yanıt / Answer D**

**5.**



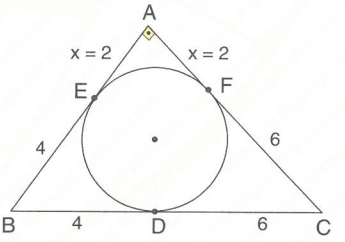

$b = |AB| = \sqrt{2}r \Rightarrow b^2 = 2r^2$

$|GF| = a \quad r^2 = a^2 + \dfrac{a^2}{4} = \dfrac{5a^2}{4} \Rightarrow a^2 = \dfrac{4r^2}{5}$

$\dfrac{A(EFGH)}{A(ABCD)} = \dfrac{a^2}{b^2} = \dfrac{\frac{4r^2}{5}}{2r^2} = \dfrac{2}{5}$

**Yanıt / Answer C**

**6.**



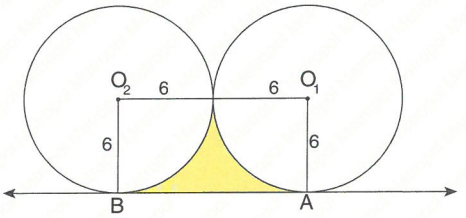

$(x+4)^2 + (x+6)^2 = 10^2$

$2x^2 + 20x - 48 = 0 \Rightarrow x = 2 \text{ cm}$

$A(\widehat{ABC}) = \dfrac{6 \cdot 8}{2} = 24 \text{ cm}^2$

**Yanıt / Answer B**

**7.**




$|O_1 \cdot O_2| = |AB| = 12$ cm

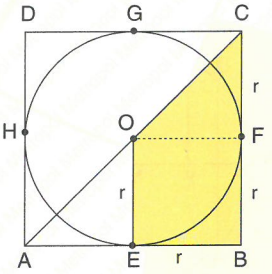
$TA/SA = 12 \cdot 6 - 2 \cdot \left(\frac{\pi \cdot 6^2}{4}\right)$

$= 72 - 18\pi$

$= 18(4 - \pi)$ cm$^2$

**Yanıt / Answer A**

**8.**

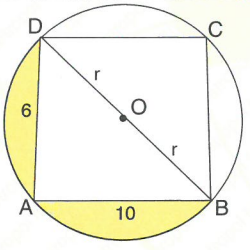



$A(OEBC) = \frac{r \cdot (r + 2r)}{2} = \frac{3r^2}{2} = 24 \Rightarrow r = 4$ cm

$A(ABCD) = 8^2 = 64$ cm$^2$

**Yanıt / Answer D**

**9.**




$(2r)^2 = 6^2 + 10^2$ [Pythagor]

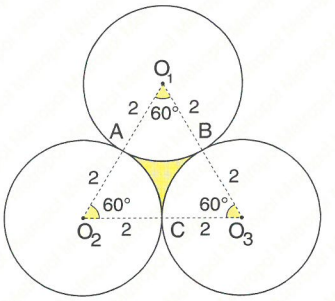
$4r^2 = 136 \Rightarrow r = \sqrt{34}$ cm

$TA/SA = \frac{\pi \cdot (\sqrt{34})^2}{2} - \frac{6 \cdot 10}{2}$

$= (17\pi - 30)$ cm$^2$

**Yanıt / Answer C**

**10.**




$O_1\overset{\triangle}{O_2}O_3$ bir ekenar üçgendir.

$O_1\overset{\triangle}{O_2}O_3$ is a equilateral triangle.

$A(O_1\overset{\triangle}{O_2}O_3) = \frac{4^2 \cdot \sqrt{3}}{4} = 4\sqrt{3}$ cm$^2$

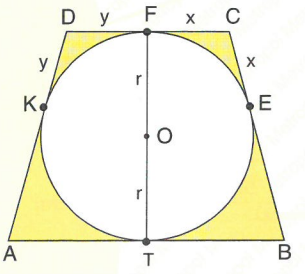
$A(O_1\overset{\triangledown}{A}B) = \frac{\pi \cdot 2^2 \cdot 60^o}{360^o} = \frac{2\pi}{3}$

$TA/SA = 4\sqrt{3} - 3 \cdot \left(\frac{2\pi}{3}\right)$

$= 4\sqrt{3} - 2\pi = 2(2\sqrt{3} - \pi)$ cm$^2$

**Yanıt / Answer A**

**11.**




$|DC| + |AB| = 2|AD| = 2|BC|$

$9 + |AB| = 2 \cdot \frac{25}{2} \Rightarrow |AB| = 16$ cm

$h = 2r = \sqrt{|AB| \cdot |CD|} = 12 \Rightarrow r = 6$ cm

$A(ABCD) = |FT| \cdot \left(\frac{|AB|.|AC|}{2}\right)$

$= 12 \cdot \left(\frac{12 + 9}{2}\right) = 150$ cm$^2$

$TA / SA = 150 - 62\pi = 150 - 36 \cdot 3 = 42$ cm$^2$

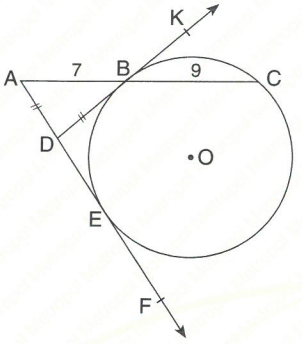
**Yanıt / Answer B**

**12.** $S_1 + S_2 = A(\widehat{ABC})$

$S_1 + S_2 = \frac{6 \cdot 8}{2} = 24$ cm$^2$

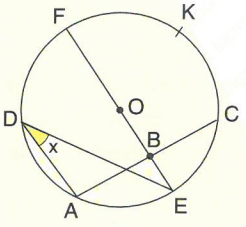
**Yanıt / Answer D**

**1.** [DK ve [AF, çembere B ve E noktalarında teğettir.
[DK and [AF are tangents are at point B and point E respectively.
IADI = IDBI,
IABI = 7 cm,
IBCI = 9 cm
⇒ **r = ? cm**



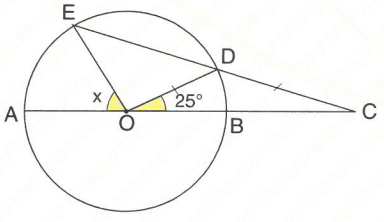

A) 5 B) 6 C) 7 D) 8 E) 9

**2.** O noktası şekildeki çemberin merkezidir.
O is center of the circle in the figure.
IABI = IBCI,
m($\widehat{FKC}$) = 160°
⇒ **m($\widehat{EDA}$) = x = ?**




A) 10° B) 20° C) 30° D) 40° E) 50°

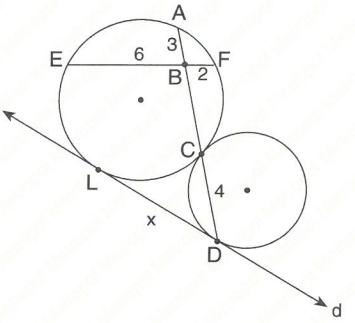
**3.**




O noktası şekildeki çemberin merkezidir.
The point O is center of the circle in the figure.
IODI = IDCI, m($\widehat{DOC}$) = 25° ⇒ **m($\widehat{EOA}$) = x = ?**

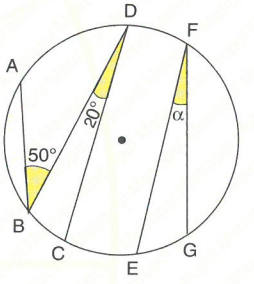
A) 65° B) 70° C) 75° D) 80° E) 85°

**4.** d doğrusu her iki çembere teğettir.
Line d is tangent to the each of the circles.
IABI = 3 cm,
IEBI = 6 cm,
IBFI = 2 cm,
ICDI = 4 cm
⇒ **ILDI = x = ? cm**



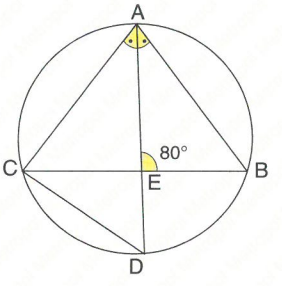

A) $\sqrt{11}$ B) $2\sqrt{11}$ C) $3\sqrt{11}$ D) $4\sqrt{11}$ E) $5\sqrt{11}$

**5.** [AB] // [FG],
[DC] // [FE],
m($\widehat{ABD}$) = 50°,
m($\widehat{BDC}$) = 20°.
⇒ **m($\widehat{EFG}$) = α = ?**



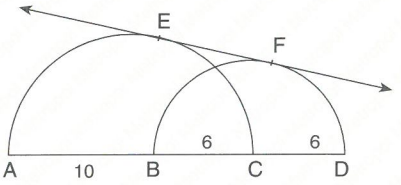

A) 10° B) 20° C) 30° D) 40° E) 50°

**6.** m($\widehat{CAD}$) = m($\widehat{DAB}$),
m($\widehat{AEB}$) = 80°
⇒ **m($\widehat{ACD}$) = ?**




A) 70° B) 80° C) 90° D) 100° E) 110°

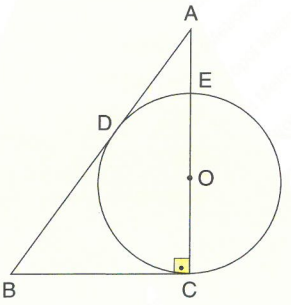
**7.**




[AC] ve [BD] doğruları çap, E ve F noktaları teğet noktalarıdır.
The line [AC] and [BD] are diameters, E and F are the tangent points. ⇒ **IEFI = ? cm**

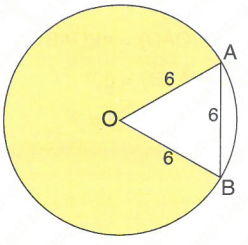
A) $\sqrt{15}$ B) $2\sqrt{15}$ C) $3\sqrt{15}$ D) $4\sqrt{15}$ E) $5\sqrt{15}$

**8.** O noktası şekildeki çemberin merkezi, D ve C teğet noktalarıdır.
The point O is center of the circle, D and C are tangent points.
3·IECI = 2·IBCI
⇒ $\frac{\text{IAEI}}{\text{IADI}}$ = ?



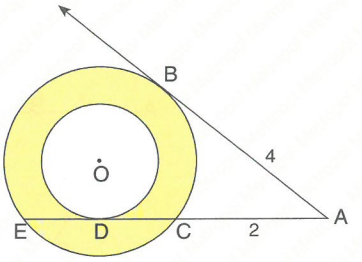

A) $\frac{1}{6}$ B) $\frac{1}{5}$ C) $\frac{1}{4}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

**9.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
IAOI = IOBI = 6 cm
IABI = 6 cm
⇒ **Şekildeki taralı alan**
the shaded area = **? cm²**




A) $10\pi$ B) $20\pi$ C) $25\pi$ D) $30\pi$ E) $40\pi$

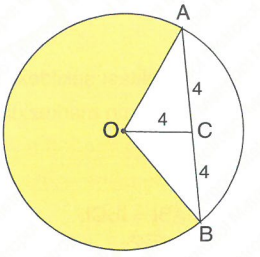
**10.**




O noktası çemberin merkezi, D noktası teğetin değme noktasıdır.
The point O is center of the circle, D is a tangent point.
IABI = 4 cm, IACI = 2 cm
⇒ **Taralı alan /** The shaded area = **? cm²**

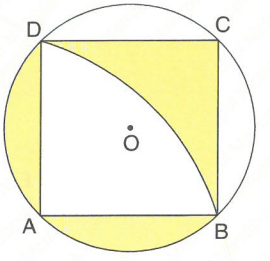
A) $4\pi$ B) $9\pi$ C) $25\pi$ D) $36\pi$ E) $49\pi$

**11.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
IOCI = IACI = 4 cm,
ICBI = 4 cm
⇒ **Şekildeki taralı alan**
The shaded area = **? cm²**




A) $15\pi$ B) $16\pi$ C) $18\pi$ D) $20\pi$ E) $24\pi$

**12.** ABCD bir karedir.
ABCD is a square.
TA / SA = 72 cm²
⇒ **r = ? cm**

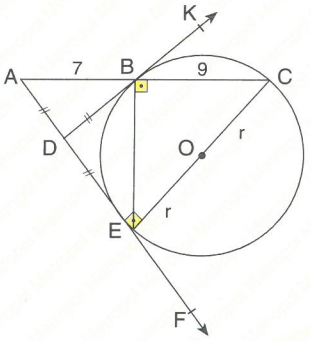



A) $2\sqrt{2}$ B) $3\sqrt{2}$ C) $4\sqrt{2}$ D) $5\sqrt{2}$ E) $6\sqrt{2}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | A | C | B | C | B | B | D | D | B | E | E |

**1.**



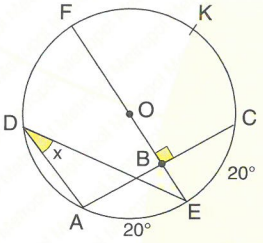

$|DE| = |BD| = |AD| \Rightarrow [AC] \perp [BE]$

$(2r)^2 = 9\cdot(9 + 7)$ [Euclid ]

$2r = 12 \Rightarrow r = 6$ cm

**Yanıt / Answer B**

**2.**



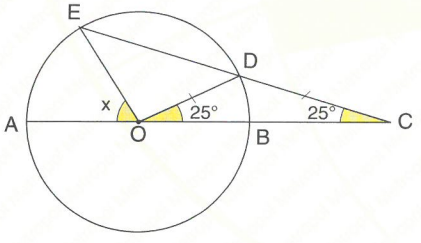

$m(\widehat{FKC}) = 160° \Rightarrow m(\widehat{CE}) = 20°$

$|AB| = |BC| \Rightarrow m(\widehat{CE}) = m(\widehat{AE}) = 20°$

$x = \dfrac{m(\widehat{AE})}{2} = 10°$

**Yanıt / Answer A**

**3.**



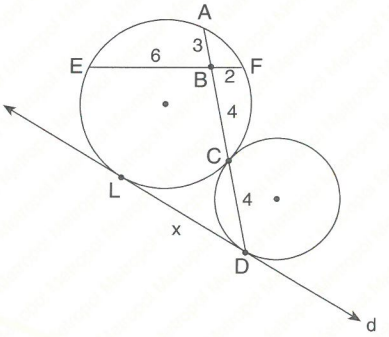

$m(\widehat{DOB}) = 25° \Rightarrow m(\widehat{DB}) = 25°$

$m(\widehat{AOE}) = x \Rightarrow m(\widehat{AE}) = x$

$25° = \dfrac{m(\widehat{AE}) - m(\widehat{DB})}{2} = \dfrac{x - 25°}{2} \Rightarrow x = 75°$

**Yanıt / Answer C**

**4.**




$|AB|\cdot|BC| = |EB|\cdot|BF|$

$3\cdot|BC| = 6\cdot 2 \Rightarrow |BC| = 4$ cm

$x^2 = |CD|\cdot|DA|$ [çemberde kuvvet / force in a circle]

$x^2 = 4\cdot 11 \Rightarrow x = 2\sqrt{11}$ cm

**Yanıt / Answer B**

**5.**

$m(\widehat{ABD}) = 50° \Rightarrow$

$m(\widehat{AD}) = 100°$

$m(\widehat{BDC}) = 20° \Rightarrow$

$m(\widehat{BC}) = 40°$

$m(\widehat{DF}) = m(\widehat{CE}) = a$

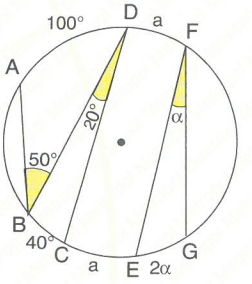
$m(\widehat{EFG}) = \alpha \Rightarrow$

$m\widehat{EG}) = 2\alpha$

$m(\widehat{AF}) = m(\widehat{BG}) \Rightarrow$

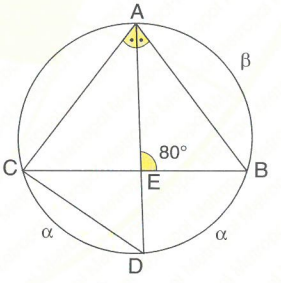
$100° + a = 40° + a + 2\alpha$

$\alpha = 30°$




**Yanıt / Answer C**

**6.**



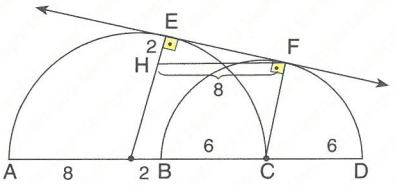

$m(\widehat{CD}) = m(\widehat{DB}) = \alpha,\ m(\widehat{AB}) = \beta$

$\dfrac{\alpha + \beta}{2} = 80° \Rightarrow \alpha + \beta = 160°$

$m(\widehat{ACD}) = x = \dfrac{\alpha + \beta}{2} = \dfrac{160°}{2} = 80°$

**Yanıt / Answer B**

**7.**




Şekildeki çemberlerin merkezlerinden teğet noktalarına doğrular çizilirse, aşağıdaki eşitlik bulunur.

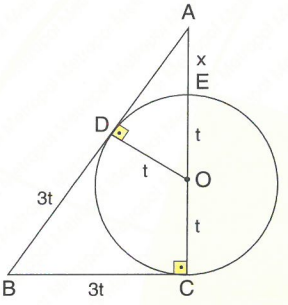
By drawing the lines to the tangent points from center of the circles in the figure, we obtain following relation.

$|EH|^2 + |EF|^2 = |FH|^2$

$2^2 + |EF|^2 = 8^2 \Rightarrow |EF| = 2\sqrt{15}$ cm

**Yanıt / Answer B**

**8.**




Çemberin merkezinden D noktasına bir doğru çizilirse, aşağıdaki benzerlik bağıntısı elde edilir.

By drawing a line to the point D from center of the circle, we get following similarity relation.

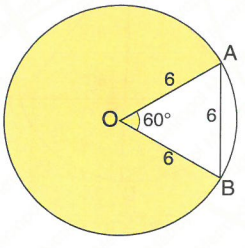
$\widehat{ADO} \sim \widehat{ACB} \Rightarrow$

$\widehat{ADO} \sim \widehat{ACB} \Rightarrow \dfrac{|AO|}{|AB|} = \dfrac{t}{3t} = \dfrac{1}{3}$

$|AD| = 3x \Rightarrow \dfrac{|AE|}{|AD|} = \dfrac{1}{3}$

**Yanıt / Answer D**

**9.**




$|AO| = |OB| = |AB| \Rightarrow m(\widehat{AOB}) = 60°$

$TA/SA = \dfrac{\pi \cdot r^2 \cdot 300°}{360°} = \dfrac{\pi \cdot 6^2 \cdot 5}{6} = 30\pi \ \text{cm}^2$

**Yanıt / Answer D**

**10.** $|AB|^2 = |AC| \cdot |AE|$ [çemberde kuvvet / force in a circle]

$16 = 2 \cdot |AE|$

$|AE| = 8$ cm

$|EC| = 6$ cm

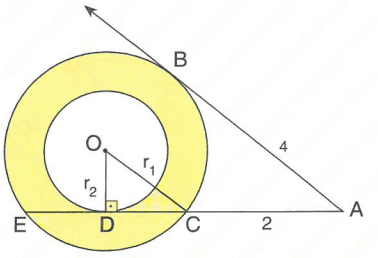
$|DC| = 3$ cm

$r_1^2 - r_2^2 = 3^2$

$= 9$

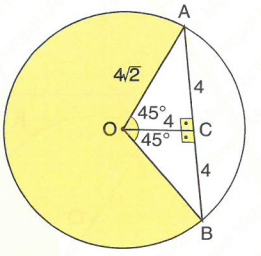
$TA / SA = \pi \cdot (r_1^2 - r_2^2)$

$= \pi \cdot (3^2) = 9\pi$




**Yanıt / Answer B**

**11.**




$|OC| = |AC| = |CB| = 4$

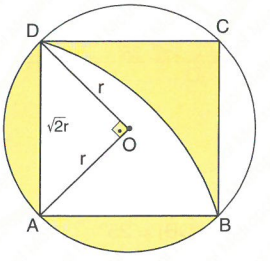
$|OA| = 4\sqrt{2}$ cm, $m(\widehat{AOB}) = 90°$ $\Rightarrow$

$TA/SA = \left(\dfrac{360° - 90°}{360°}\right) \cdot \pi \cdot (4\sqrt{2})^2$

$= \dfrac{3}{4} \cdot \pi \cdot 32 = 24\pi \ \text{cm}^2$

**Yanıt / Answer E**

**12.**



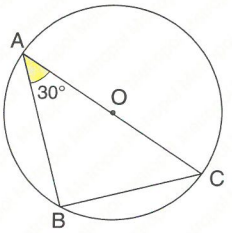

$|AB| = \sqrt{2}r \Rightarrow A(ABCD) = (\sqrt{2}r)^2 = 2r^2$

$TA/SA = \left(2r^2 - \dfrac{\pi(\sqrt{2}r)^2}{4}\right) + \left(\dfrac{\pi r^2 - (\sqrt{2}r)^2}{2}\right)$

$72 = \dfrac{2r^2}{2} \Rightarrow = 72 \Rightarrow r = 6\sqrt{2}$ cm

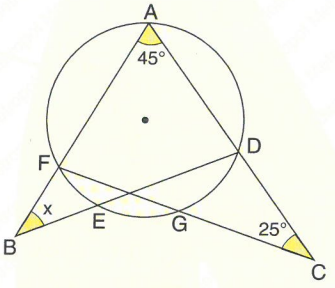
**Yanıt / Answer E**

**1.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
m(BAC) = 30°,
IBCI = $4\sqrt{3}$ cm
⇒ **r = ? cm**



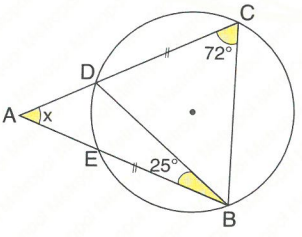

A) 4 B) $4\sqrt{3}$ C) 6 D) 9 E) 12

**2.** $m(\widehat{BAC}) = 45°$,
$m(\widehat{ACF}) = 25°$
$m(\widehat{GD}) = 20°$,
$m(\widehat{FE}) = 10°$
⇒ **$m(\widehat{ABD}) = x = ?$**



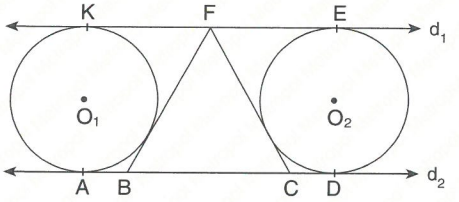

A) 75° B) 80° C) 85° D) 90° E) 95°

**3.** IDCI = IEBI,
$m(\widehat{DCB}) = 72°$,
$m(\widehat{DBA}) = 25°$
⇒ **$m(\widehat{CAB}) = x = ?$**




A) 24° B) 36° C) 38° D) 40° E) 42°

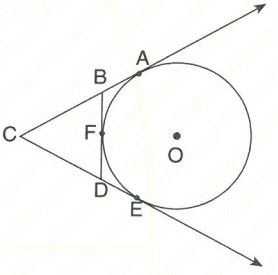
**4.**




Şekildeki $O_1$ ve $O_2$ merkezli iki çemberin yarıçapları eşit olup $d_1$ ve $d_2$ doğruları iki çemberin ortak teğetleridir.
The line $d_1$ and $d_2$ are tangents to the each of the circles also the radiuses are equals in the figure.
IADI = 15 cm ⇒ **IFBI + IFCI + IBCI = ? cm**

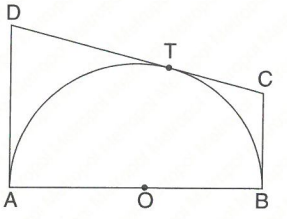
A) 15 B) 30 C) 45 D) 60 E) 75

**5.** Şekildeki O merkezli çemberin A, F ve E teğet noktalarıdır.
A, F and E are tangent points.
IBFI = 2 cm,
ICBI = 10 cm,
IFDI = 3 cm
⇒ **ICDI = ? cm**



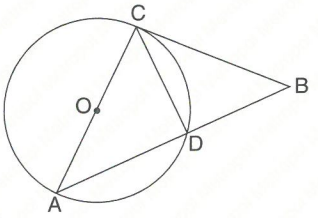

A) 7 B) 8 C) 9 D) 10 E) 11

**6.** O noktası çemberin merkezi, A, B ve T teğet noktalarıdır.
The point O is center of the circle, A, B and F are tangent points.
IABI = 12 cm,
ICBI = 2 cm ⇒ **IDCI = ? cm**



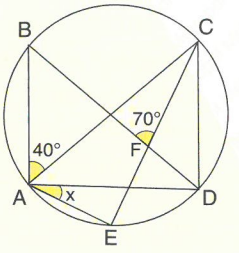

A) 17 B) 18 C) 19 D) 20 E) 21

**7.** O noktası çemberin merkezi, C teğet noktasıdır.
The point O is center of the circle, C is a tangent point.
IDCI = 10 cm,
ICBI = 15 cm ⇒ **IADI = ? cm**



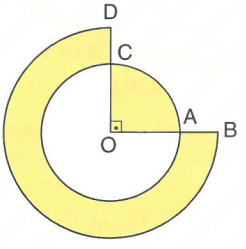

A) $\sqrt{5}$ B) $2\sqrt{5}$ C) $3\sqrt{5}$ D) $4\sqrt{5}$ E) $5\sqrt{5}$

**8.** m(BAC) = 40°,
m(BFC) = 70°
⇒ **m(DAE) = x = ?**



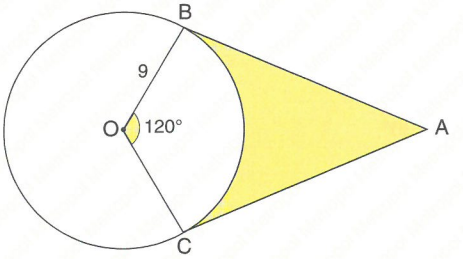

A) 10° B) 20° C) 25° D) 30° E) 35°

**9.** O noktası şekildeki çemberin merkezidir.
The point O is center of the circle in the figure.
[DO] ⊥ [OB],
IOCI = 4 cm,
IOBI = 8 cm
⇒ **Taralı alan / The shaded area = ? cm²**




A) $30\pi$ B) $36\pi$ C) $40\pi$ D) $54\pi$ E) $60\pi$

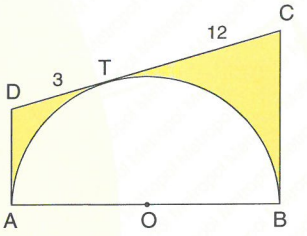
**10.**




O noktası çemberin merkezi, B ve C teğetin değme noktalarıdır.
The point O is center of the circle, B and C are tangent points in the figure.
$m(\widehat{BOC}) = 120°$, IOBI = 9 cm
⇒ **Taralı alan / The shaded area = ? cm² ($\pi$= 3)**

A) $18(3\sqrt{3} - 2)$ B) $18(\sqrt{3} - 1)$
C) $36(\sqrt{3} - 1)$ D) $72(\sqrt{3} - 1)$
E) $81(\sqrt{3} - 1)$

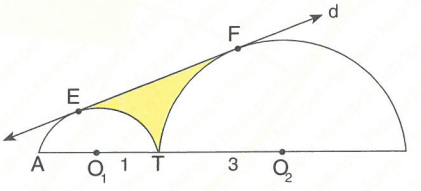
**11.**




O noktası şekildeki yarım çemberin merkezidir.
IDTI = 3 cm, ITCI = 12 cm
⇒ **Taralı alan / The shaded area = ? cm²**

A) $36(4 - \pi)$ B) $24(6 - \pi)$ C) $12(6 - \pi)$
D) $18\left(3 - \frac{\pi}{2}\right)$ E) $18(5 - \pi)$

**12.**




$O_1$ ve $O_2$ şekildeki yarım çemberlerin merkezidir.
$|O_1T| = 1$ cm, $|TO_2| = 3$ cm
⇒ **Taralı alan / The shaded area = ? cm²**

A) $2\sqrt{3} - \frac{7\pi}{6}$ B) $4\sqrt{3} - \frac{11\pi}{6}$ C) $\sqrt{3} - \frac{\pi}{4}$
D) $6 - \frac{\pi}{3}$ E) $8 - \frac{5\pi}{11}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | E | B | B | C | D | D | D | C | E | E | B |

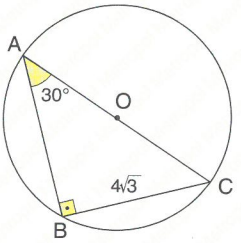
**1.** $\perp \widehat{ABC}$ (30°, 60°, 90°) $\Rightarrow$

$|AC| = 2|BC|$

$|AC| = 8\sqrt{3}$ cm

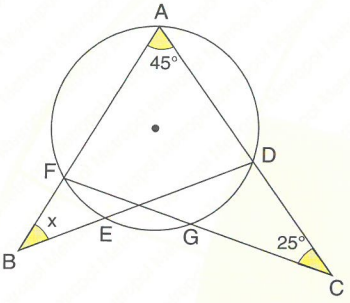
$r = \dfrac{|AC|}{2}$

$R = 4\sqrt{3}$ cm




**Yanıt / Answer B**

**2.**




$m(\widehat{FED}) = 90° \Rightarrow m(\widehat{EG}) = 60°$

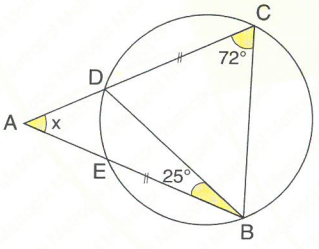
$\dfrac{m(\widehat{AF}) - m(\widehat{GD})}{2} = 25°$

$m(\widehat{AF}) = 70° \Rightarrow m(\widehat{AD}) = 200°$

$x = \dfrac{m(\widehat{AD}) - m(\widehat{FE})}{2} \Rightarrow x = \dfrac{200° - 10°}{2} = 95°$

**Yanıt / Answer E**

**3.**




$\left.\begin{array}{l} m(\widehat{DE}) = 50° \\ m(\widehat{DB}) = 144° \end{array}\right\} m(\widehat{EB}) = 94° \Rightarrow m(\widehat{DC}) = 94°$

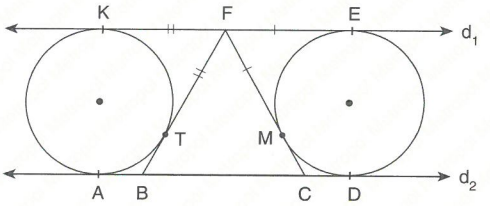
$m(\widehat{BC}) = 122°$

$x = \dfrac{m(\widehat{BC}) - m(\widehat{DE})}{2}$

$= \dfrac{122° - 50°}{2} = 36°$

**Yanıt / Answer B**

**4.**




$|KF| = |FT|$, $|FE| = |FM|$,

$|AB| = |BT|$, $|MC| = |CD|$

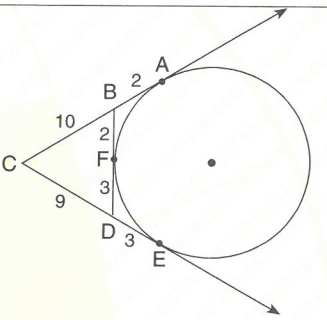
$|AD| = 15$ cm $\Rightarrow |BT| + |BC| + |MC| = 15$ cm

$|KE| = 15$ cm $\Rightarrow |FT| + |FM| = 15$ cm

$|FB| + |BC| + |FC| = 30$ cm

**Yanıt / Answer B**

**5.**




$|BF| = |BA| = 2$ cm,

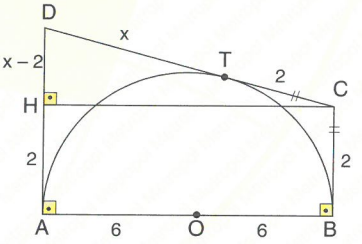
$|FD| = |DE| = 3$ cm

$|CA| = |CE| \Rightarrow 10 + 2 = |CD| + 3$

$|CD| = 9$ cm

**Yanıt / Answer C**

**6.**




$[CH] \perp [AD]$

$|CT| = |CB| = |HA| = 2$ cm

$|DT| = |DA| = x$ cm $\Rightarrow |DH| = (x - 2)$ cm

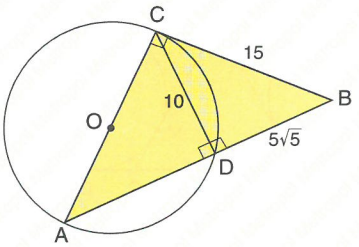
$|CH| = |AB| = 12$ cm

$(x + 2)^2 = 12^2 + (x - 2)^2 \Rightarrow x = 18$ cm

$|DC| = 18 + 2 = 20$ cm

**Yanıt / Answer D**

**7.**




$\perp \widehat{CAB}$,

Çemberde çapı gören çevre açı 90° dir.

The size of an inscribed angle subtending the diameter is 90° in a circle.

$m(CDA) = 90°$

$[AC] \perp [CB] \Rightarrow$

$|DB|^2 = 15^2 - 10^2$ [Pythagor]

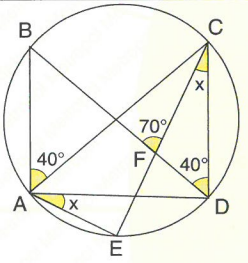
$|DB| = 5\sqrt{5}$ cm

$10^2 = 5\sqrt{5} \cdot |DA|$ [Euclid]

$|DA| = 4\sqrt{5}$ cm

**Yanıt / Answer D**

**8.**




$\widehat{BAC} = \widehat{BDC} = 40°$

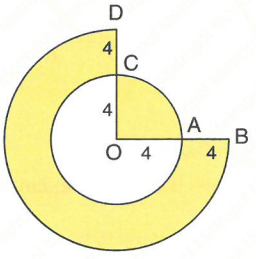
$\widehat{EAD} = \widehat{ECD} = x$

$70° = x + 40°$

$x = 30°$

**Yanıt / Answer D**

**9.**

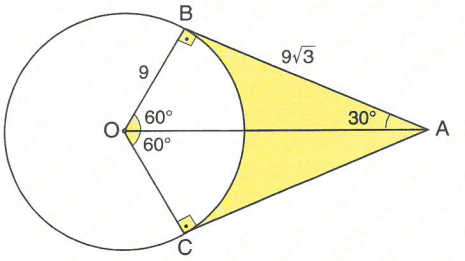



$$TA/SA = \frac{3}{4} \cdot (8^2\pi - 4^2\pi) + \frac{1}{4}\pi \cdot 4^2$$

$$= \frac{3}{4} \cdot 48\pi + 4\pi = 40\pi \text{ cm}^2$$

**Yanıt / Answer C**

**10.**



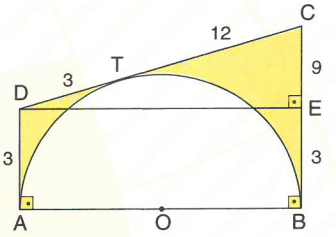

$|AB| = 9\sqrt{3}$, $A(ABOC) = 81\sqrt{3}$ cm$^2$

$$A(\overset{\triangledown}{ABC}) = \frac{\pi \cdot 9^2}{3} \text{ cm}^2$$

$$TA/SA = 81\sqrt{3} - 27\pi = 81(\sqrt{3} - 1) \text{ cm}^2$$

**Yanıt / Answer E**

**11.**




$|DC|^2 = |DE|^2 + |EC|^2$ [Pythagor]

$|DE| = |AB| = \sqrt{15^2 - 9^2} = 12$ cm

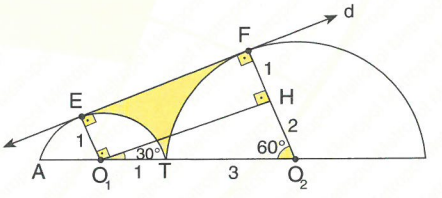
$$r = \frac{|DE|}{2} = 6 \text{ cm}$$

$$TA/SA = \frac{12 \cdot 15}{2} - \frac{\pi \cdot 6^2}{2}$$

$$= 18(5 - \pi) \text{ cm}^2$$

**Yanıt / Answer E**

**12.**




$|FO_2| = 3$ cm $\Rightarrow$ $|FH| = 1$ cm,

$|HO_2| = 2$ cm, $|EF| = |O_1H|$

$|EF| = \sqrt{4^2 - 2^2} = 2\sqrt{3}$ cm

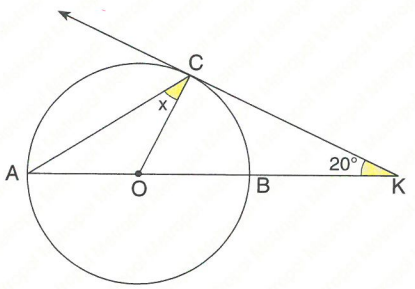
$$A(O_1O_2FE) = \frac{(1+3) \cdot 2\sqrt{3}}{2} = 4\sqrt{3} \text{ cm}^2$$

$$TA/SA = 4\sqrt{3} - \left(\frac{\pi \cdot 1^2}{3} + \frac{\pi \cdot 3^2}{6}\right)$$

$$= 4\sqrt{3} - \frac{11\pi}{6} \text{ cm}^2$$

**Yanıt / Answer B**

**1.**




O noktası şekildeki çemberin merkezidir.

Point O is center of the circle in the figure.

$m(\widehat{CKA}) = 20° \Rightarrow$ **$m(\widehat{ACO}) = x = ?$**

A) 20° B) 25° C) 30° D) 35° E) 40°

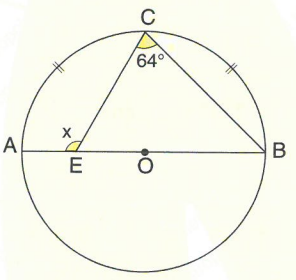
**2.** O noktası şekildeki çemberin merkezidir.

Point O is center of the circle in the figure.

$m(\widehat{AC}) = m(\widehat{CB})$,

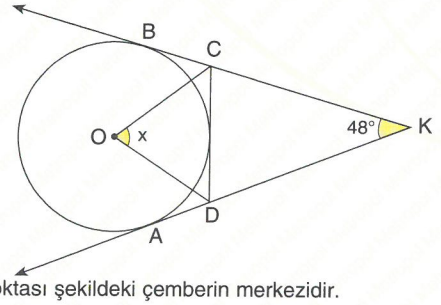
$m(\widehat{ECB}) = 64°$

$\Rightarrow$ **$m(\widehat{CEA}) = x = ?$**




A) 106° B) 109° C) 116° D) 118° E) 120°

**3.**




O noktası şekildeki çemberin merkezidir.

Point O is center of the circle in the figure.

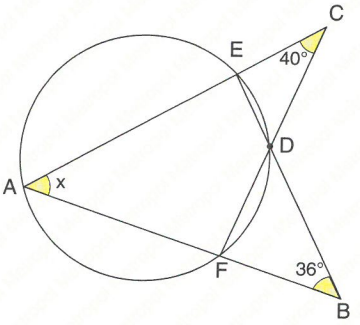
$m(\widehat{AKB}) = 48° \Rightarrow$ **$m(\widehat{COD}) = x = ?$**

A) 48° B) 52° C) 60° D) 66° E) 72°

**4.** $m(\widehat{ECD}) = 40°$,

$m(\widehat{DBF}) = 36°$

$\Rightarrow$ **$m(\widehat{CAB}) = x = ?$**




A) 48° B) 52° C) 56° D) 64° E) 76°

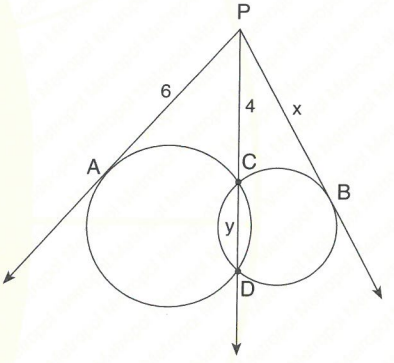
**5.** IPAI = 6 cm,

IPCI = 4 cm,

ICDI = y,

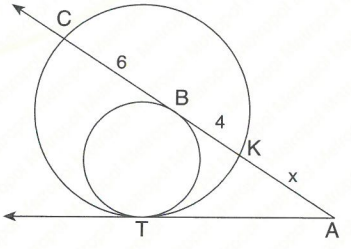
IPBI = x cm

$\Rightarrow$ **x + y = ?**




A) 8 B) 9 C) 10 D) 11 E) 12

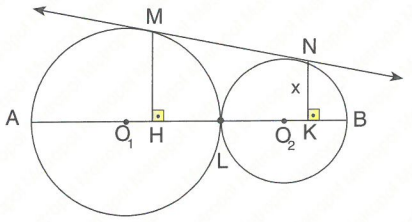
**6.**




ICBI = 6 cm, IBKI = 4 cm $\Rightarrow$ **IAKI = x = ? cm**

A) 4 B) 5 C) 6 D) 7 E) 8

**7.**




$O_1$ ve $O_2$ noktası şekildeki çemberlerin merkezidir.

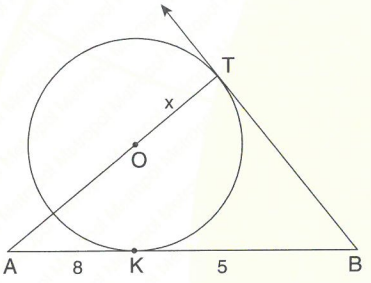
Points $O_1$ and $O_2$ are center of the circles in the figure.

[MH] ⊥ [AB], [NK] ⊥ [AB], IMNI = 14 cm, IMHI = 9 cm

⇒ **INKI = ? cm**

A) 3 B) 4 C) 5 D) 6 E) 7

**8.**




O noktası şekildeki çemberin merkezidir.

Point O is center of the circle in the figure.

IAKI = 8 cm, IKBI = 5 cm ⇒ **IOTI = x = ? cm**

A) 2 B) $\frac{5}{2}$ C) 3 D) $\frac{10}{3}$ E) 4

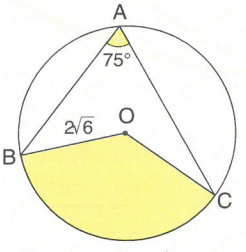
**9.** O noktası şekildeki çemberin merkezidir.

Point O is center of the circle in the figure.

$m(\widehat{BAC}) = 75°$

IBOI = $2\sqrt{6}$ cm

⇒ **TA/SA = ? cm²**




A) $8\pi$ B) $10\pi$ C) $12\pi$ D) $14\pi$ E) $15\pi$

**10.** O noktası şekildeki çemberin merkezidir.

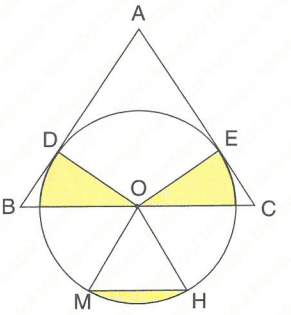
Point O is center of the circle in the figure.

IABI = IACI = IBCI,

IABI = $4\sqrt{3}$ cm,

$m(\widehat{MOH}) = 60°$

⇒ **TA/SA = ? cm²**




A) $\frac{12\pi - 9\sqrt{3}}{4}$ B) $\frac{12\pi - 9\sqrt{3}}{2}$ C) $\frac{12\pi - 3\sqrt{3}}{4}$

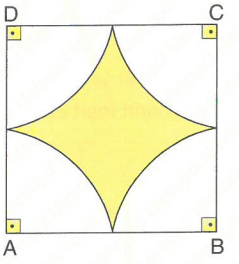
D) $\frac{12\pi - 3\sqrt{3}}{2}$ E) $\frac{12\pi - \sqrt{3}}{4}$

**11.** A, B, C, D merkez, ABCD bir karedir.

A, B, C, D are center ABCD is a square.

IABI = 12 cm

⇒ **TA/SA = ? cm²**




A) $144 - 72\pi$ B) $144 - 36\pi$ C) $144 - 24\pi$

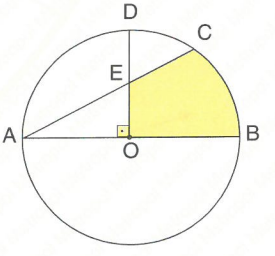
D) $144 - 12\pi$ E) $144 - 9\pi$

**12.** O noktası şekildeki çemberin merkezidir.

Point O is center of the circle in the figure.

IECI = IEOI = $2\sqrt{3}$ cm

⇒ **TA/SA = ? cm²**



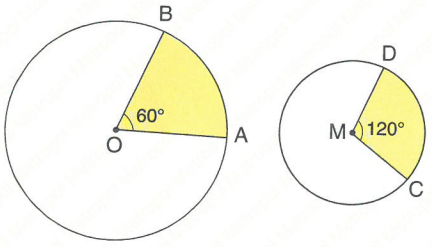

A) $6\pi - \sqrt{3}$ B) $6\pi - 2\sqrt{3}$ C) $6\pi - 3\sqrt{3}$

D) $6\pi + 2\sqrt{3}$ E) $6\pi + 3\sqrt{3}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | B | D | B | D | E | C | D | B | A | B | E |

**1.**

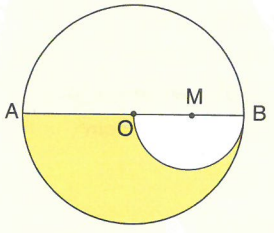



O ve M noktaları merkezdir. / Points O and M are center.

$|OA| = 2 \cdot |MC| \Rightarrow \dfrac{A(MCD)}{A(AOB)} = ?$

A) 1 B) $\frac{2}{3}$ C) $\frac{1}{2}$ D) $\frac{1}{3}$ E) $\frac{1}{4}$

**2.** O ve M noktası şekildeki çemberlerin merkezidir.
Points $O_1$ and $M_2$ are center of the circles in the figure.

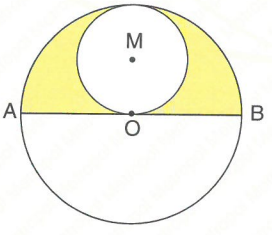



$|AB| = 16$ cm

$\Rightarrow$ **TA/SA = ? cm²**

A) $16\pi$ B) $18\pi$ C) $20\pi$ D) $24\pi$ E) $32\pi$

**3.** O ve M noktası şekildeki çemberlerin merkezidir.
Points O and M are center of the circles in the figure.

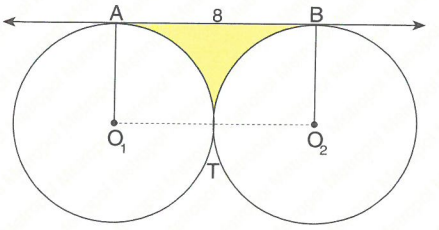



$|AB| = 12$ cm

$\Rightarrow$ **TA/SA = ? cm²**

A) $6\pi$ B) $8\pi$ C) $9\pi$ D) $12\pi$ E) $15\pi$

**4.**

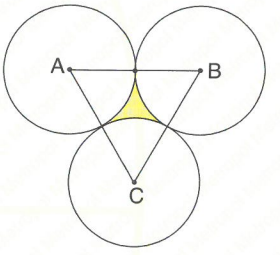



$O_1$ ve $O_2$ noktası şekildeki çemberlerin merkezidir.
Point $O_1$ and $O_2$ are center of the circles in the figure.

$|O_1T| = |TO_2|$, $|AB| = 8$ cm $\Rightarrow$ **TA/SA = ? cm²**

A) $32 - 8\pi$ B) $32 - 4\pi$ C) $64 - 24\pi$ D) $64 - 8\pi$ E) $64 - 8\pi$

**5.** A, B ve C noktaları şekildeki çemberlerin merkezidir.
Points A, B, C are center of the circles in the figure.



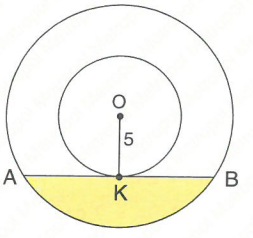

$|AB| = |AC| = |BC|$

$|AB| = 8$ cm

$\Rightarrow$ **TA/SA = ? cm²**

A) $8\pi - 8\sqrt{3}$ B) $16\sqrt{3} - 8\pi$ C) $32\sqrt{3} - 8\pi$ D) $16\sqrt{3} - 4\pi$ E) $16\sqrt{3} - 2\pi$

**6.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.




$|OK| = 5$ cm,

$|AB| = 10\sqrt{3}$ cm

$\Rightarrow$ **TA/SA = ? cm²**

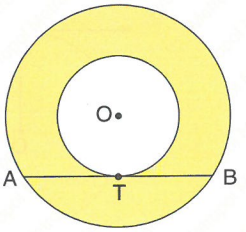
A) $50\pi - 15\sqrt{2}$ B) $50\pi - 15\sqrt{3}$ C) $25\pi - 10\sqrt{3}$ D) $\dfrac{50\pi - 25\sqrt{3}}{3}$ E) $\dfrac{100\pi - 75\sqrt{3}}{3}$

**7.** O noktası şekildeki çemberin merkezidir.

Point O is center of the circle in the figure.

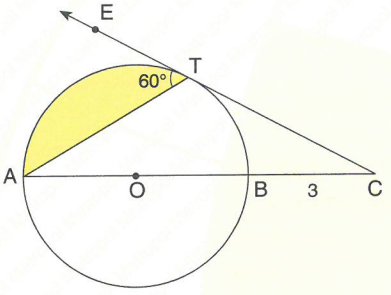
IABI = 10 cm

⇒ **TA/SA = ? cm²**




A) $5\pi$ B) $10\pi$ C) $15\pi$ D) $20\pi$ E) $25\pi$

**8.**




O noktası şekildeki çemberin merkezidir.

Point O is center of the circle in the figure.

IBCI = 3 cm, $m(\widehat{ETA}) = 60°$ ⇒ **TA/SA = ? cm²**

A) $6\pi - 3\sqrt{3}$ B) $6\pi - 2\sqrt{3}$ C) $12\pi - 3\sqrt{3}$

D) $\frac{6\pi - 6\sqrt{3}}{4}$ E) $\frac{12\pi - 9\sqrt{3}}{4}$

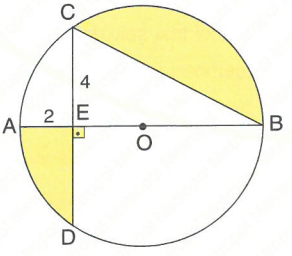
**9.** O noktası şekildeki çemberin merkezidir.

Point O is center of the circle in the figure.

ICEI = 4 cm,

IAEI = 2 cm

⇒ **TA/SA = ? cm²**

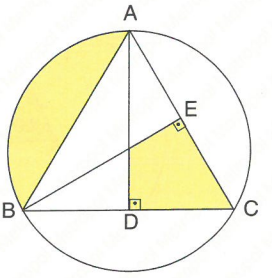



A) $\frac{25\pi - 32}{2}$ B) $\frac{25\pi - 16}{2}$ C) $\frac{25\pi - 8}{2}$

D) $36 - 4\pi$ E) $25\pi - 16$

**10.** IABI = IACI = IBCI = 12 cm

⇒ **TA/SA = ? cm²**




A) $8\pi$ B) $12\pi$ C) $16\pi$

D) $12\sqrt{3}$ E) $16\sqrt{3}$

**11.** O noktası şekildeki çemberin merkezidir.

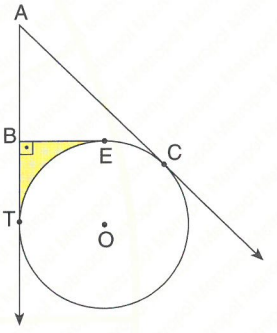
Point O is center of the circle in the figure.

IABI = 8 cm

IACI = 10 cm

[BE] çembere teğet ise

⇒ **TA/SA = ? cm²**




A) $4 - \pi$ B) $16 - 2\pi$ C) $36 - 8\pi$

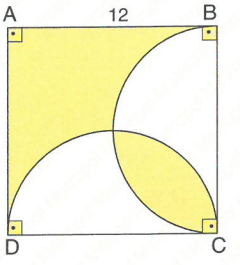
D) $36 - 4\pi$ E) $24 - 2\pi$

**12.** ABCD bir karedir.

ABCD is a square.

IABI = 12 cm

⇒ **TA/SA = ? cm²**



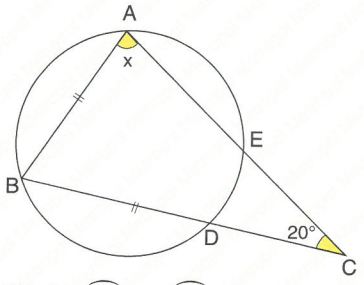

A) $36 - 8\pi$ B) $36\pi - 8$ C) 36

D) 72 E) $36\pi$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | D | C | A | B | E | E | E | A | C | A | D |

**1.**



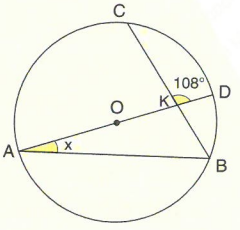

$m(\widehat{ACB}) = 20°$, $2 \cdot m(\widehat{ED}) = m(\widehat{AE})$, $|AB| = |BD|$

$\Rightarrow$ **$m(\widehat{BAC}) = x = ?$**

A) 60° B) 68° C) 72° D) 76° E) 80°

**2.** O noktası şekildeki çemberin merkezidir.

Point O is center of the circle in the figure.



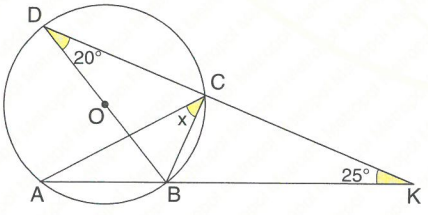

$m(\widehat{CKD}) = 108°$,

$m(\widehat{CDB}) = 120°$

$\Rightarrow$ **$m(\widehat{DAB}) = x = ?$**

A) 21° B) 24° C) 30° D) 36° E) 42°

**3.**



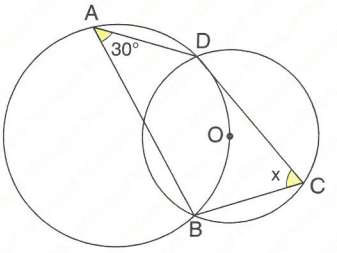

O noktası şekildeki çemberin merkezidir.

Point O is center of the circle in the figure.

$m(\widehat{CDB}) = 20°$, $m(\widehat{DKA}) = 25°$, $\Rightarrow$ **$m(\widehat{ACB}) = x = ?$**

A) 25° B) 30° C) 35° D) 40° E) 45°

**4.**




O noktası şekildeki çemberin merkezidir.

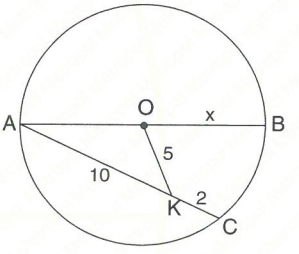
Point O is center of the circle in the figure.

$m(\widehat{DAB}) = 30°$ $\Rightarrow$ **$m(\widehat{DCB}) = x = ?$**

A) 60° B) 65° C) 70° D) 75° E) 80°

**5.** O noktası şekildeki çemberin merkezidir.

Point O is center of the circle in the figure.




$|OK| = 5$ cm,

$|KC| = 2$ cm,

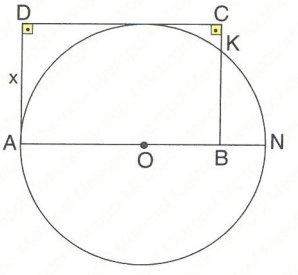
$|AK| = 10$ cm

$\Rightarrow$ **$|OB| = x = ?$ cm**

A) $3\sqrt{3}$ B) $3\sqrt{5}$ C) $3\sqrt{6}$ D) $4\sqrt{5}$ E) $4\sqrt{6}$

**6.** O noktası şekildeki çemberin merkezidir.

Point O is center of the circle in the figure.



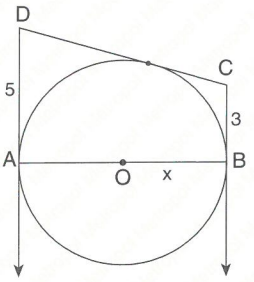

$|BN| = 3$ cm,

$|KB| = 6$ cm

$\Rightarrow$ **$|AD| = x = ?$ cm**

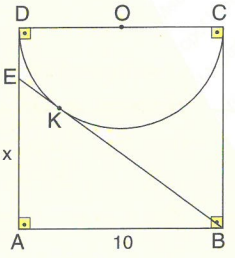
A) $\frac{15}{2}$ B) 8 C) $\frac{17}{2}$ D) 9 E) $\frac{19}{2}$

**7.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
ICBI = 3 cm,
IADI = 5 cm
⇒ **IOBI = x = ? cm**



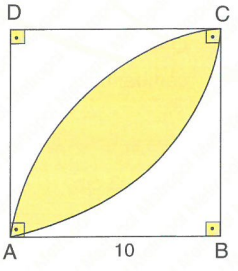

A) $\sqrt{10}$ B) $2\sqrt{3}$ C) $\sqrt{15}$ D) $3\sqrt{2}$ E) $2\sqrt{5}$

**8.** O noktası şekildeki çemberin merkezi, ABCD bir karedir.
Point O is center of the circle in the figure, ABCD is a square.
IABI = 10 cm
⇒ **IAEI = x = ? cm**



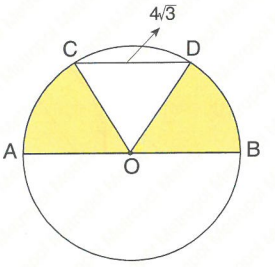

A) 6 B) $\frac{13}{2}$ C) 7 D) $\frac{15}{2}$ E) 8

**9.** D ve B noktaları çeyrek çemberin merkez, ABCD bir karedir.
Points D and B are center ABCD is a square.
IABI = 10 cm
⇒ **TA/SA = ? cm²**



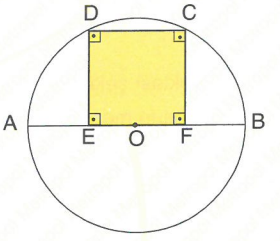

A) $10(\pi - 2)$ B) $25(\pi - 2)$ C) $50(\pi - 2)$
D) $25(2\pi - 2)$ E) $50(2\pi - 3)$

**10.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
IABI = $8\sqrt{3}$ cm,
ICDI = $4\sqrt{3}$ cm
⇒ **TA/SA = ? cm²**



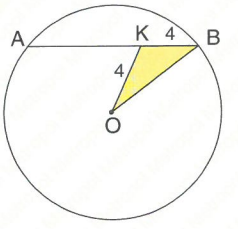

A) $12\pi$ B) $16\pi$ C) $18\pi$ D) $24\pi$ E) $32\pi$

**11.** O noktası şekildeki çemberin merkezi, EFCD bir karedir.
Point O is center of the circle in the figure, EFCD is a square.
IABI = 10 cm
⇒ **A(EFCD) = ? cm²**




A) 20 B) 25 C) 30 D) 45 E) 50

**12.** O noktası şekildeki çemberin merkezidir.
Point O is center of the circle in the figure.
IAKI = 8 cm, IKBI = 4 cm,
IOKI = 4 cm
⇒ **A($\widehat{OKB}$) = ? cm²**




A) $2\sqrt{3}$ B) $3\sqrt{3}$ C) $4\sqrt{3}$
D) $5\sqrt{3}$ E) $6\sqrt{3}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | A | E | D | B | A | C | D | C | B | A | C |

# BÖLÜM CHAPTER 13

## TARİHSEL NOT / HISTORICAL NOTE

### René Descartes [1596 – 1650]

Fransız matematikçi, filozof ve bilim adamıydı. Çalışmaları, Newton ve Leibniz tarafından geliştirilen, teğet çizgisi problemine sonsuz küçüklük uygulayan, böylece modern matematiğin bu dalının evrimine izin veren kalkülüsün temelini sağlamıştır. Onun işaret kuralı, aynı zamanda, bir polinomun pozitif ve negatif köklerinin sayısını belirlemek için yaygın olarak kullanılan bir yöntemdir. Ayrıca optik alanına katkılarda bulundu, geometrik konstrüksiyon ve kırılma yasası (Descartes yasası veya daha sıklıkla bilinen Snel yasası) kullanarak bir gökkuşağının açısal yarıçapının 42 derece olduğunu gösterdi.

He was a French mathematician, philosopher, and scientist. His work provided the basis for the calculus developed by Newton and Leibniz, who applied infinitesimal calculus to the tangent line problem, thus permitting the evolution of that branch of modern mathematics. His rule of signs is also a commonly used method to determine the number of positive and negative roots of a polynomial. He also made contributions to the field of optics, he showed by using geometric construction and the law of refraction (also known as Descartes law or more commonly Snell's law) that the angular radius of a rainbow is 42 degrees.

# DOĞRUNUN ANALİTİĞİ
# LINE in ANALYTIC GEOMETRY

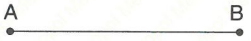
**Bu bölüm 48 çözümlü test sorusu ve 12 test sorusu içermektedir.**

**This chapter includes 48 test questions with solutions and 12 test questions.**

**BÖLÜM / CHAPTER 13**

**DOĞRUNUN ANALİTİĞİ / LINE in ANALYTIC GEOMETRY**

**1.**

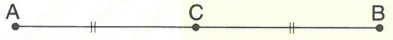



$a \in Z^+$, A (3, a), B(–3, 4)

IABI = 10 br (u) ⇒ **a = ? br(u)**

A) 12 B) 10 C) 9 D) 8 E) 6

**2.**




A (6, 4), B(8, a – 1), C(x, y),

x + y = 9 ⇒ **a = ? br(u)**

A) –1 B) 0 C) 1 D) 2 E) 3

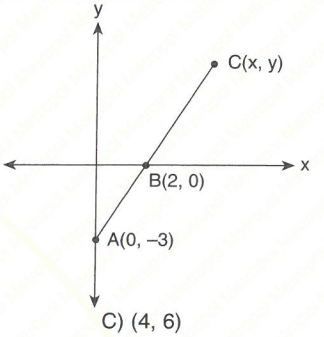
**3.**


A (1, 0), B(4, 6), C(m, 1) ⇒ **m = ?**

A) 3 B) 2 C) 1 D) $\frac{5}{2}$ E) $\frac{3}{2}$

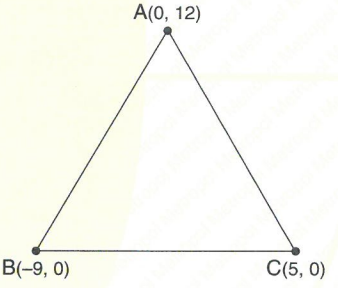
**4.** 2·IABI = IBCI

⇒ **C(x, y) = (?, ?)**




A) (6, 6) B) (6, 4) C) (4, 6) D) (4, 4) E) (6, 8)

**5.**



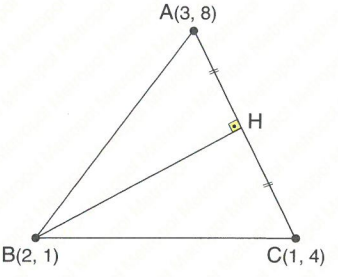

**Çevre / The perimeter ($\widehat{ABC}$) = ? br(u)**

A) 40 B) 42 C) 55 D) 60 E) 75

**6.** [BH] ⊥ [AC],

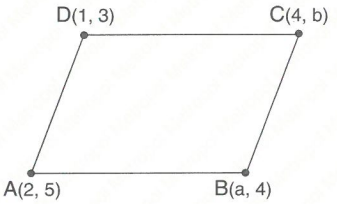
IAHI = IHCI

⇒ **IBHI = ? br(u)**




A) 4 B) 5 C) 6 D) 7 E) 8

**7.**




ABCD bir paralelkenardır. / ABCD is a paralellogram.

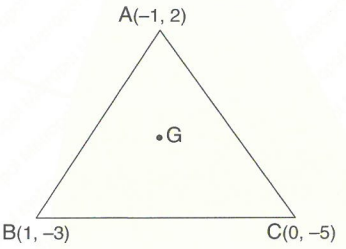
$\Rightarrow$ **a + b = ? br(u)**

A) 5 B) 6 C) 7 D) 8 E) 9

**8.** G noktası ağırlık merkezidir.

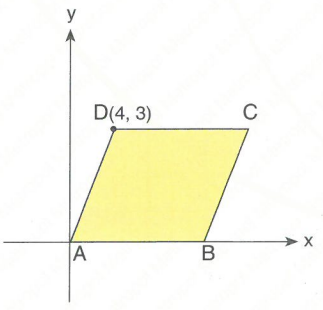
Point G is center of the gravity.

$\Rightarrow$ **G(x, y) = (?, ?)**




A) (–2, 0) B) (–3, 0) C) (0, –1) D) (0, –2) E) (0, –3)

**9.**



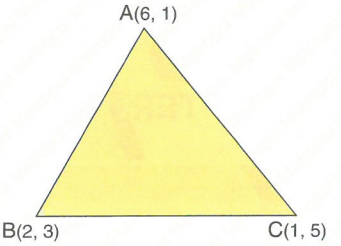

ABCD bir eşkenar dörtgendir.

ABCD is an equilateral quadrangle.

$\Rightarrow$ **A(ABCD) = ? br$^2$(u)$^2$**

A) 30 B) 24 C) 20 D) 16 E) 15

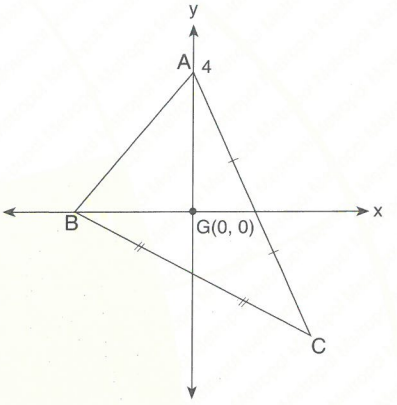
**10.**




$\Rightarrow$ **A($\widehat{ABC}$) = ? br$^2$ (u$^2$)**

A) 3 B) $\frac{5}{2}$ C) 2 D) $\frac{3}{2}$ E) 1

**11.**



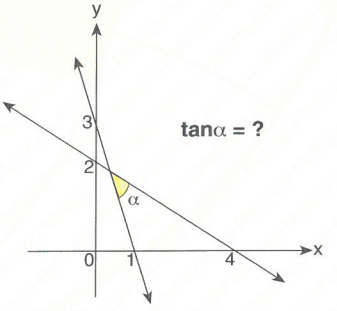

G noktası ABC üçgeninin ağırlık merkezidir.

The point G is center of the gravity in the ABC triangle.

A($\widehat{ABC}$) = 36 br$^2$(u$^2$), A(0, 4), B(x, 0) $\Rightarrow$ **x = ?**

A) –7 B) –6 C) –5 D) –4 E) –3

**12.**




A) 1 B) $\frac{3}{2}$ C) 2 D) $\frac{5}{2}$ E) 3

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | C | E | A | B | B | C | D | E | A | B | A |

**1.**


İki nokta arasındaki uzaklık formülü.

The distance between two points formula is.

$$|AB| = \sqrt{(-3-3)^2 + (4-a)^2}$$

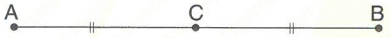
$$10 = \sqrt{36 + (4-a)^2}$$

$$|4-a| = 8 \Rightarrow a = 12 br(u) \quad (a \in Z^+)$$

**Yanıt / Answer A**

---

**2.**




C noktası, |AB|'nin orta noktasıdır.

The point C is midpoint of the |AB|.

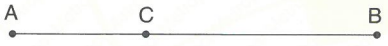
$$x = \frac{6+8}{2} = 7 \text{ ve(and) } x + y = 9 \Rightarrow y = 2$$

$$y = \frac{4+a-1}{2} \Rightarrow 2 = \frac{3+a}{2} \Rightarrow a = 1 br(u)$$

**Yanıt / Answer C**

---

**3.**




AC ve BC doğrularının eğimleri eşittir.

The slope of AC and BC lines are equals.

$$\left.\begin{array}{l} m_{AB} = \dfrac{6-0}{4-1} = 2 \\ M_{BC} = \dfrac{1-6}{m-4} = -\dfrac{5}{m-4} \end{array}\right\} \Rightarrow 2 = \frac{-5}{m-4} \Rightarrow m = \frac{3}{2}$$

**Yanıt / Answer E**

---

**4.** Bir doğruyu belli bir oranda bölen bir noktanın koordinatları formülü.

The coordinates of a point divides a line a certain ratio formula is.

$$\frac{|AB|}{|BC|} = \frac{1}{2} \Rightarrow \begin{cases} x_B = \dfrac{2x_A + x_c}{2+1} \\ y_B = \dfrac{2y_A + y_c}{2+1} \end{cases}$$

$$\Rightarrow \begin{cases} 2 = \dfrac{0+x}{3} \Rightarrow x = 6 \\ 0 = \dfrac{-6+y}{3} \Rightarrow y = 6 \end{cases}$$

**Yanıt / Answer A**

---

**5.** İki nokta arasındaki uzaklık formülü.

The distance between two points formula is.

$$|AB| = \sqrt{9^2 + 12^2} = 15 \text{ br(u)}$$

$$|AC| = \sqrt{5^2 + 12^2} = 13 \text{ br(u)}$$

$$|BC| = \sqrt{(5-(-9))^2 + 0^2} = 14 \text{ br(u)}$$

Çevre (ABC) = 42

**Yanıt / Answer B**

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**6.** H noktası, |AC|'nin orta noktasıdır.

The point H is midpoint of the |AC|.

$$H\left(\frac{3+1}{2}, \frac{8+4}{2}\right) \Rightarrow H(2,6)$$

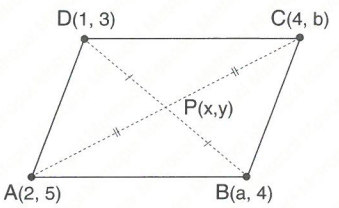
İki nokta arasındaki uzaklık formülü.

The distance between two points formula is.

$$|BH| = \sqrt{(2-2)^2 + (6-1)^2} = 5 \text{ br(u)}$$

**Yanıt / Answer B**

**7.**




$x = \frac{1+a}{2} = \frac{4+2}{2} \Rightarrow a = 5\,br(u)$

$y = \frac{5+b}{2} = \frac{4+4}{2} \Rightarrow b = 2\,br(u)$

$\Rightarrow a + b = 7 = br(u)$

**Yanıt / Answer C**

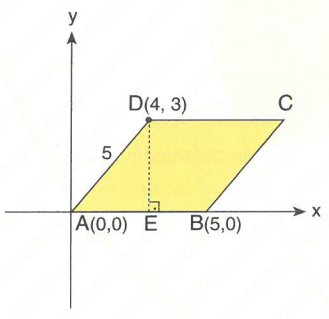
**8.** Bir üçgenin ağırlık merkezi formülü.

The center of the gravity formula is in a triangle.

$$\left.\begin{aligned} x_G &= \frac{x_A + x_B + x_C}{3} \\ x_G &= \frac{-1+1+0}{3} \\ y_G &= \frac{y_A + y_B + y_C}{3} \\ y_G &= \frac{2+(-3)+(-5)}{3} = -2 \end{aligned}\right\} \Rightarrow G(0,-2)$$

**Yanıt / Answer D**

**9.**




IAEI = 4 br(u), IDEI = 3 br(u)

Paralelkenarın yüksekliği 3 br(u), yüksekliğe ait kenar uzunluğu 5 br(u) dir.

The height is 3 br(u), the side lenght is 5 br(u) in the figure paralellogram.

A(ABCD) = 3·5 = 15 $br^2(u^2)$

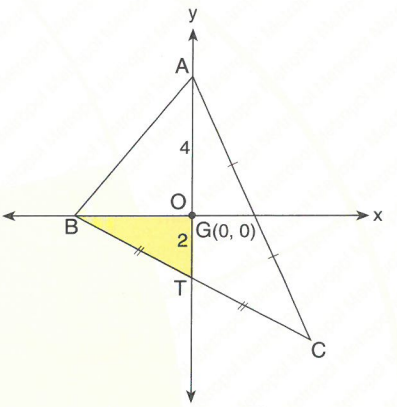
**Yanıt / Answer E**

**10.** $S = \frac{1}{2} \cdot \begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$

$A(\widehat{ABC}) = \frac{1}{2} \cdot \begin{vmatrix} 6 & 1 & 1 \\ 2 & 3 & 1 \\ 1 & 5 & 1 \end{vmatrix} = 3\,br^2(u^2)$

**Yanıt / Answer A**

**11.**



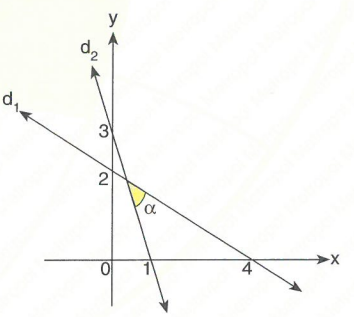

$A(\widehat{OBT}) = \frac{A(\widehat{ABC})}{6}$

$\frac{|OB| \cdot |OT|}{2} = \frac{36}{6}$

$|OB| = 6 \Rightarrow x = -6$

**Yanıt / Answer B**

**12.**




Eğim formülü / The slope formula is.

$m_{d_1} = -\frac{2}{4} = -\frac{1}{2}$, $m_{d_2} = -\frac{3}{1} = -3$

İki nokta arasındaki açı formülü.

The angle between two points formula is.

$\tan\alpha = \frac{m_{d1} - m_{d_2}}{1 + m_{d_1} \cdot m_{d_2}} \Rightarrow \tan\alpha = \frac{\frac{1}{2} - (-3)}{1 + \left(-\frac{1}{2}\right).(-3)} = 1$

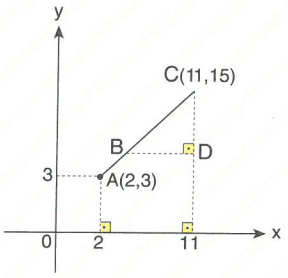
**Yanıt / Answer A**

**1.** A(2, 3), C(11, 15)

[CD] ⊥ [BD]

$\frac{|CB|}{|CA|} = \frac{2}{3}$

**⇒ |BD| + |DC| = ? br(u)**

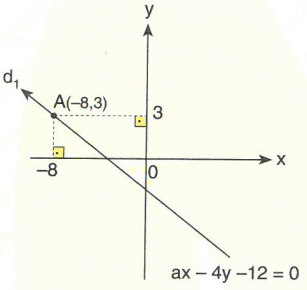



A) 13 B) 14 C) 15 D) 16 E) 17

**2.** $d_1$: ax – 4y –12 = 0

A(–8, 3)

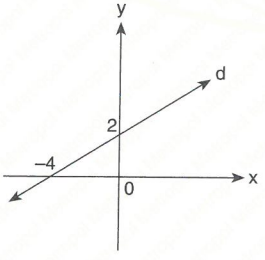
**⇒ a = ?**




A) –3 B) $-\frac{5}{2}$ C) – 2 D) $-\frac{3}{2}$ E) –1

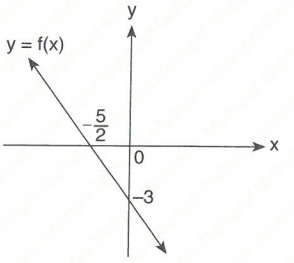
**3.** d : ax + by + c = 0

**⇒ a + b + c = ?**




A) 3 B) 4 C) 5 D) 6 E) 7

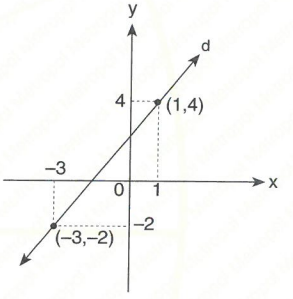
**4.** **⇒ f(– 5) = ?**




A) 0 B) 1 C) 2 D) 3 E) 4

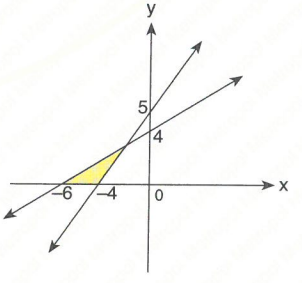
**5.** d : y = mx + n

**⇒ m·n = ?**




A) $\frac{11}{2}$ B) 6 C) $\frac{13}{4}$ D) $\frac{15}{4}$ E) 4

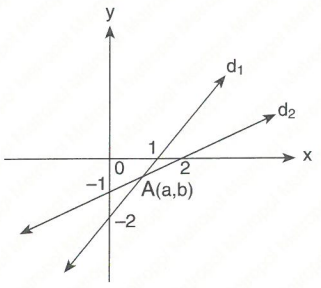
**6.**




**Taralı alan / The shaded area = ? br²(u²)**

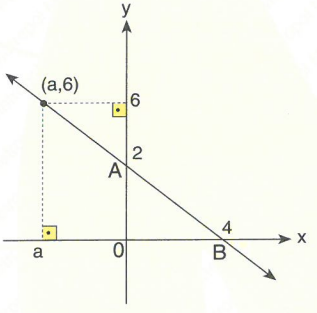
A) 2 B) $\frac{15}{7}$ C) $\frac{18}{7}$ D) $\frac{20}{7}$ E) 3

**7.** $d_1 \cap d_2 = A(a, b)$
$\Rightarrow$ **a – b = ?**



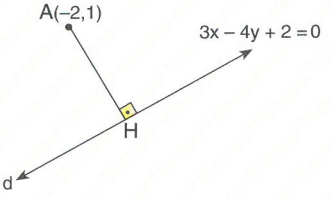

A) –1 B) $\frac{1}{2}$ C) 1 D) $\frac{3}{2}$ E) $\frac{4}{3}$

**8.** A(0, 2), B(4, 0) $\Rightarrow$ **a = ?**



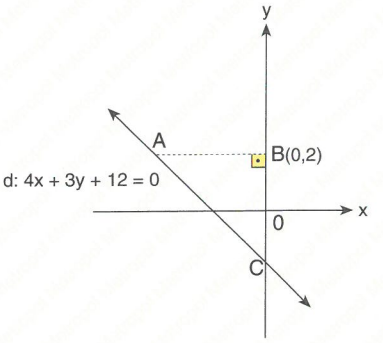

A) –9 B) –8 C) –7 D) –6 E) –5

**9.** d: 3x – 4y + 2 = 0
[AH] ⊥ d,
A(– 2, 1)
$\Rightarrow$ **|AH| = ? br(u)**



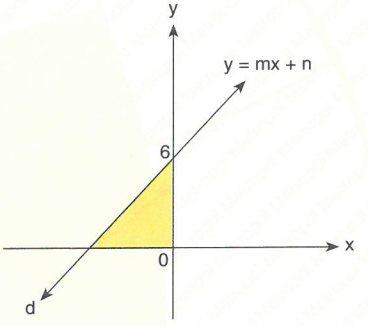

A) 1,2 B) 1,3 C) 1,4 D) 1,5 E) 1,6

**10.** d: 4x + 3y + 12 = 0
B(0, 2)
$\Rightarrow$ **$A(\widehat{ABC})$ = ? $br^2(u^2)$**




A) 6 B) 8 C) $\frac{27}{2}$ D) 10 E) $\frac{24}{5}$

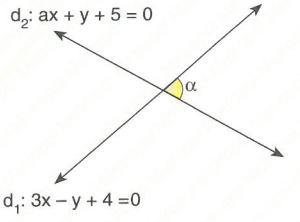
**11.**




d : y = mx + n
TA / SA = 9 $br^2(u^2)$
$\Rightarrow$ **m + n = ?**

A) 8 B) 9 C) 10 D) 11 E) 12

**12.** $d_1$: 3x – y + 4 = 0
$d_2$: ax + y + 5 = 0
tanα = 2
$\Rightarrow$ **a = ? br(u)**

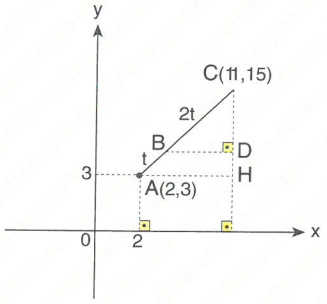



A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) 2 E) $\frac{5}{2}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | A | A | D | D | D | E | B | E | C | A | B |

**1.**




$\widehat{CBD} \sim \widehat{CAH}$

$\frac{|CB|}{|CA|} = \frac{|BD|}{|AH|} = \frac{|CD|}{|CH|} = \frac{2}{3}$

$|AH| = 11 - 2 = 9\,br(u)$

$\frac{|BD|}{9} = \frac{2}{3} = |BD| = 6\,br(u)$

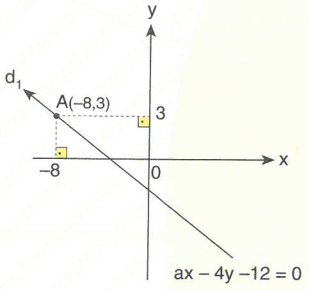
$|CH| = 15 - 3 = 12\,br(u)$

$\frac{|CD|}{12} = \frac{2}{3} \Rightarrow |CD| = 8\,br(u)$

$\Rightarrow |BD| + |DC| = 8 + 6 = 14\,br(u)$

**Yanıt / Answer B**

**2.**




$A \in d_1 \Rightarrow -8a - 12 - 12 = 0$

$-8a = 24 \Rightarrow a = -3$

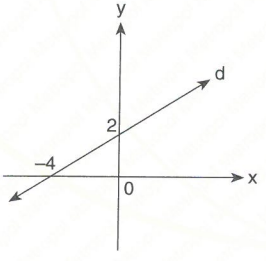
**Yanıt / Answer A**

**3.** $\frac{x}{a} + \frac{y}{b} = 1$

$d: \frac{x}{-4} + \frac{y}{2} = 1$

$x - 2y + 4 = 0$

$a + b + c = 3\,br(u)$



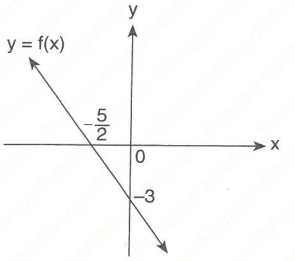

**Yanıt / Answer A**

**4.** $\frac{x}{a} + \frac{y}{b} = 1$

$\frac{x}{-\frac{5}{2}} + \frac{y}{-3} = 1$

$f(x) = y = \frac{-6x}{5} - 3$

$f(-5) = -\frac{6(-8)}{5} - 3 = 3$




**Yanıt / Answer D**

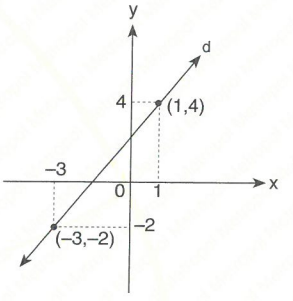
**5.** $d: (y - y_1) = m \cdot (x - x_1)$

$d: y - 4 = \frac{4-(-2)}{1-(-3)} \cdot (x - 1)$

$y - 4 = \frac{3}{2}(x - 1)$

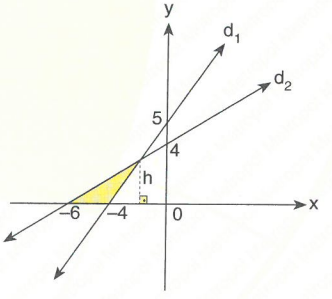
$y = \frac{3}{2}x + \frac{5}{2}$

$\Rightarrow m \cdot n = \frac{15}{4}$




**Yanıt / Answer D**

**6.**




$d_1: \frac{x}{-4} + \frac{y}{5} = 1 \Rightarrow 5x - 4y + 20 = 0$

$d_2: \frac{x}{-6} + \frac{y}{4} = 1 = 2x - 3y + 12 = 0$

$d_1 \cap d_2 = (x, y) \Rightarrow$

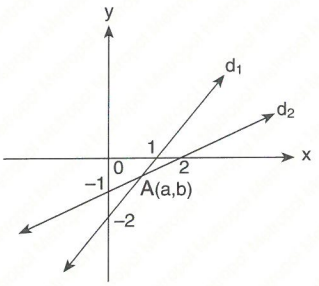
$$\begin{array}{r} 2/5x+4y+20=0 \\ +\ -5/2x+3y+12=0 \\ \hline 7y-20=0 \end{array}$$

$y = h = \frac{20}{7}\,br(u)$

$TA/SA = \frac{2 \cdot \frac{20}{7}}{2} = \frac{20}{7}\,br^2(u^2)$

**Yanıt / Answer D**

**7.**




$d_1: \frac{x}{1} + \frac{y}{-2} = 1 \Rightarrow 2x - y - 2 = 0$

$d_2: \frac{x}{2} + \frac{y}{-1} = 1 \Rightarrow x - 2y - 2 = 0$

$2x - y - 2 = 0$

$+ \; -2/x - 2y - 2 = 0$

$3y = -2 \Rightarrow y = -\frac{2}{3}$

$d_1: 2x + \frac{2}{3} - 2 = 0 \Rightarrow x = \frac{2}{3}$

$d_1 \cap d_2 = \left\{\left(\frac{2}{3}, -\frac{2}{3}\right)\right\} \Rightarrow$

$a = \frac{2}{3}, b = -\frac{2}{3} \Rightarrow a - b = \frac{2}{3} - \left(-\frac{2}{3}\right) = \frac{4}{3}$

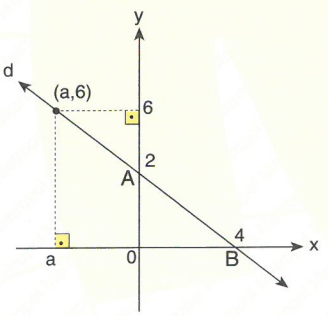
**Yanıt / Answer E**

**8.** $d: \frac{x}{4} + \frac{y}{2} = 1$

$(a,6) \in d \Rightarrow$

$\frac{a}{4} + \frac{6}{2} = 1$

$a = -8$




**Yanıt / Answer B**

**9.** $|AH| = h = \frac{|a \cdot x_1 + b \cdot y_1 + c|}{\sqrt{a^2 + b^2}} \Rightarrow$

$|AH| = \frac{|3 \cdot (-2) - 4 \cdot 1 + 2|}{\sqrt{3^2 + (-4)^2}} = \frac{8}{5} = 1{,}6\,br(u)$

**Yanıt / Answer E**

**10.** $A = (a,2) \in d \Rightarrow$

$4a + 6 + 12 = 0$

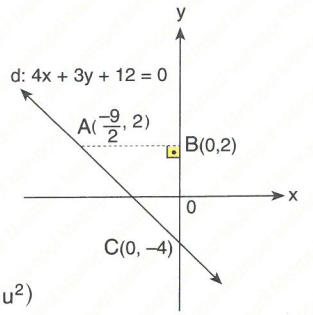
$4a = -18$

$a = -\frac{9}{2}$

$|AB| = \frac{9}{2}\,br(u)$

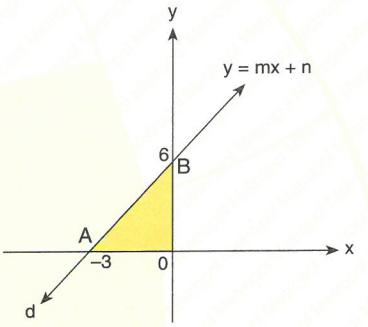
$|BC| = 6\,br(u)$

$A(\widehat{ABC}) = \frac{\frac{9}{2} \cdot 6}{2} = \frac{27}{2}\,br^2(u^2)$




**Yanıt / Answer C**

**11.**




$A(\widehat{AOB}) = \frac{|AO| \cdot |OB|}{2} = 9\,br^2(u^2)$

$\frac{|OA| \cdot 6}{2} = 9 \Rightarrow |AO| = 3\,br(u)$

$A(-3,0) \Rightarrow$

$\frac{x}{-3} + \frac{y}{6} = 1$

$y = 2x + 6 \Rightarrow m + n = 2 + 6 = 8\,br(u)$

**Yanıt / Answer A**

**12.** $d_1: 3x - y + 4 = 0 \Rightarrow m_1 = 3$

$d_1: ax + y + 5 = 0 \Rightarrow m_2 = -a$

$\tan(180^\circ - \alpha) = \frac{m_1 - m_2}{1 + m_1 \cdot m_2}$

$-2 = \frac{3 + a}{1 - 3a} \Rightarrow -2 + 6a = 3 + a$

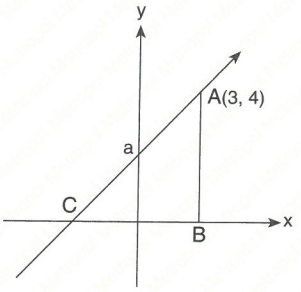
$a = 1\,br(u)$

**Yanıt / Answer B**

**1.** A(3, 4)

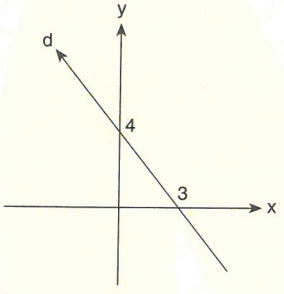
$A(\widehat{ABC}) = 16\ br^2(u^2)$

$\Rightarrow$ **a = ?**




A) 2 B) $\frac{5}{2}$ C) 3 D) $\frac{7}{2}$ E) 4

**2.** $\Rightarrow$ **d : = ?**



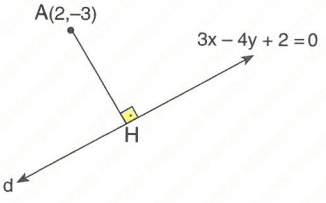

A) 3x + 4y = 12 B) 4x + 3y = –12
C) 4x + 3y = 12 D) 3x + 4y = –12
E) 4x + 4y = 12

**3.** A(2, –3),

d: 3x – 4y + 2 = 0

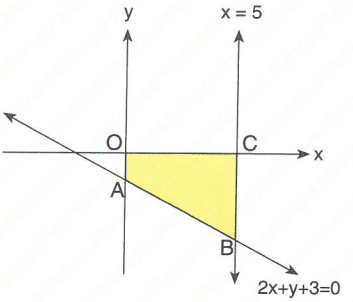
[AH] ⊥ d

$\Rightarrow$ **IAHI = ? br(u)**




A) 2 B) 3 C) 4 D) 5 E) 6

**4.** **$A(ABCO) = ?\ br^2(u^2)$**




A) 20 B) 30 C) 40 D) 50 E) 60

**5.** $d_1$: x + 5y – 6y = 0

$d_2: \frac{x}{3} - \frac{y}{2} = 1$

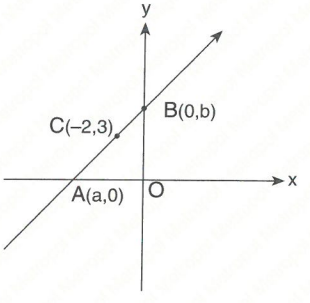
**Doğrularının kesim noktasından ve orijinden geçen doğrunun denklemi nedir?**

What is the equation of the line passing through the intersection of $d_1$ and $d_2$, also passing through the origine?

A) x + y = 0 B) x – 2y = 0
C) x – 8y = 0 D) x + 4y = 0
E) x – 5y = 0

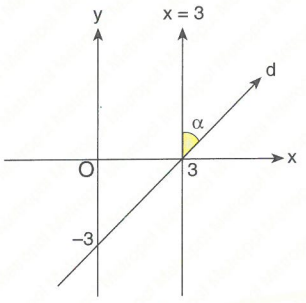
**6.** IACI = ICBI

**$A(\widehat{ABO}) = ?\ br^2(u^2)$**



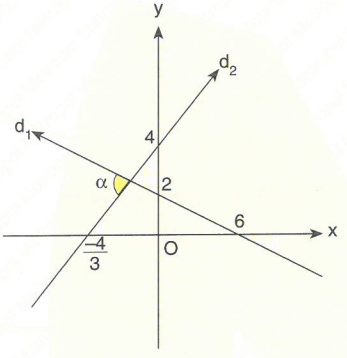

A) 6 B) 12 C) 18 D) 24 E) 32

**7.** $\Rightarrow \alpha = ?$



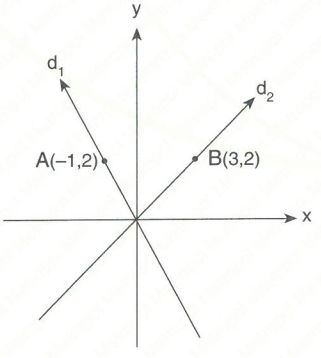

A) 75° B) 60° C) 45° D) 30° E) 15°

**8.** $\Rightarrow \alpha = ?$



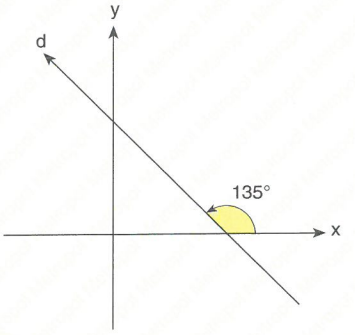

A) 90° B) 60° C) 45° D) 30° E) 15°

**9.** $\Rightarrow m_{d_1} \cdot m_{d_2} = ?$




A) $-\frac{4}{3}$ B) $-\frac{2}{3}$ C) $\frac{2}{3}$ D) $\frac{3}{4}$ E) $\frac{4}{3}$

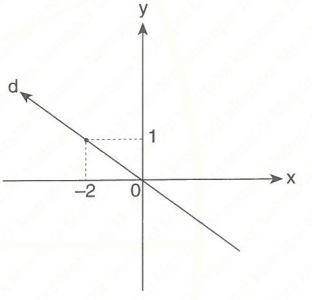
**10.**




$m_d = 3a + 1 \Rightarrow$ **a = ?**

A) 2 B) – 1 C) $-\frac{2}{3}$ D) 1 E) 2

**11.** $\Rightarrow m_d = ?$




A) 2 B) 1 C) $\frac{1}{2}$ D) $-\frac{1}{2}$ E) – 2

**12.** $d_1 // d_2$ $\Rightarrow$ **a = ?**

$d_1$: $2x - ax + 3y - 5 = 0$

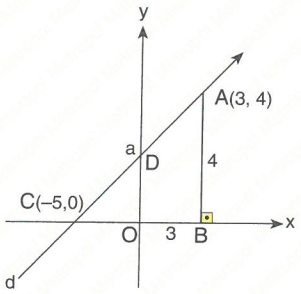
$d_2$: $2x - y + 2 = 0$

A) 1 B) 2 C) 3 D) 6 E) 8

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | C | C | C | C | B | C | A | A | C | D | E |

1.




$A(\widehat{ABC}) = \frac{|BC| \cdot |AB|}{2} \Rightarrow 16 = \frac{|BC| \cdot 4}{2}$

$\Rightarrow |BC| = 8\,br(u) \Rightarrow |OC| = 5\,br(u)$

$\widehat{COD} \sim \widehat{CBA} \Rightarrow$

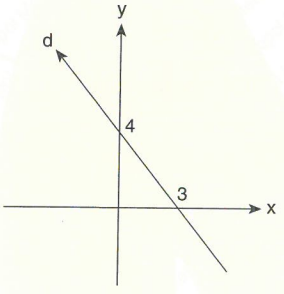
$\frac{|DO|}{|AB|} = \frac{|CO|}{|CB|} \Rightarrow \frac{a}{4} = \frac{5}{5+3}$

$8a = 20 \Rightarrow a = \frac{5}{2}$

**Yanıt / Answer B**

2. $d: \frac{x}{3} + \frac{y}{4} = 1$

$\Rightarrow 4x + 3y = 12$




**Yanıt / Answer C**

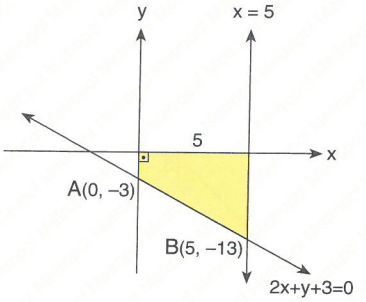
3. $\left.\begin{array}{l} A(2,-3), \\ d: 3x - 4y + 2 = 0 \end{array}\right\} \Rightarrow$

$|AH| = h = \frac{|a \cdot x_1 + b \cdot y_1 + c|}{\sqrt{a^2 + b^2}}$

$|AH| = \frac{|3.2 - 4 \cdot (-3) + 2|}{\sqrt{3^2 + -4^2}} = \frac{20}{5} = 4\,br(u)$

**Yanıt / Answer C**

4.




$|OA| = 3\,br(u)$, $|CB| = 13\,br(u)$

$A(ABCO) = \frac{5 \cdot (3 + 13)}{2} = 40\,br^2(u^2)$

**Yanıt / Answer C**

5. $\underbrace{d_1: x + 5y - 6 = 0,\ d_2: \frac{x}{3} - \frac{y}{2} = 1}$

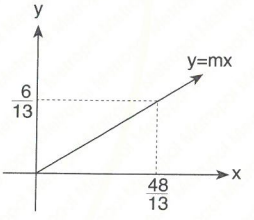
$\Downarrow$

$$\begin{array}{rl} & -2\ /\ x+5y-6=0 \\ + & -2x-3y-6=0 \\ \hline & -13y+6=0 \end{array} \Rightarrow y = \frac{6}{13}$$

$d_1: x + 5 \cdot \frac{6}{13} - 6 = 0 \Rightarrow x = \frac{48}{13}$

$d_1 \cap d_2 = \left\{\left(\frac{48}{13}, \frac{6}{13}\right)\right\}$

$m = \frac{\frac{6}{13}}{\frac{48}{13}} = \frac{1}{8} \Rightarrow y = \frac{1}{8}x$



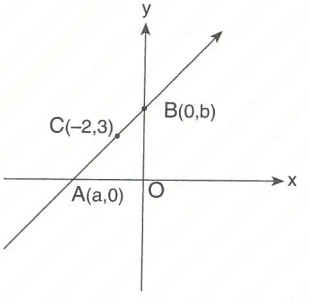

**Yanıt / Answer C**

6. $\frac{a+0}{2} = -2 \Rightarrow a = -4\,br(u)$

$\frac{0+b}{2} = 3 \Rightarrow b = 6\,br(u)$

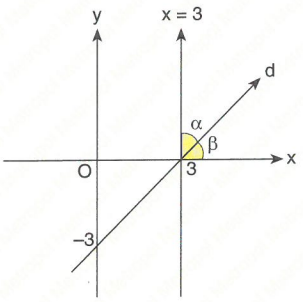
$A(\widehat{ABO}) \frac{6 \cdot 4}{2}$

$= 12\,br^2(u^2)$




**Yanıt / Answer B**

**7.**

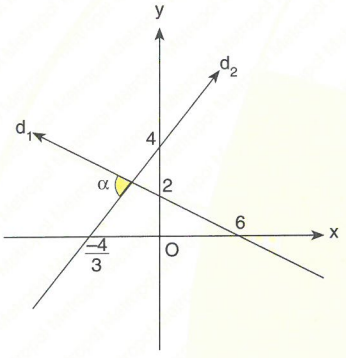



$$\left.\begin{array}{r} m_d = 1 = \tan\beta \\ \beta = 45° \end{array}\right\} \Rightarrow \alpha = 90° - \beta$$

$\alpha = 45°$

**Yanıt / Answer C**

**8.**

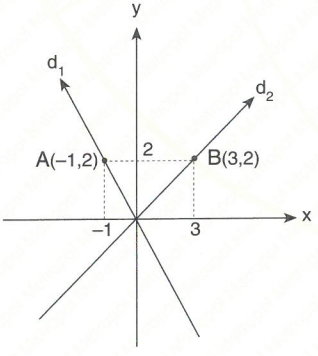



$$\left.\begin{array}{l} m_{d_1} = -\frac{2}{6} = -\frac{1}{3} \\ m_{d_2} = \frac{4}{\frac{4}{3}} = 3 \end{array}\right\} \Rightarrow m_{d_1} \cdot m_{d_2} = -\frac{1}{3} \cdot 3 = -1 \text{ olduğundan}$$

$\Rightarrow d_1 \perp d_2 \Rightarrow \alpha = 90^o$

**Yanıt / Answer A**

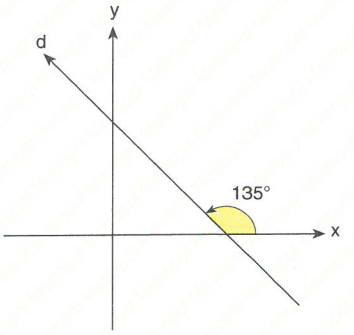
**9.**




$$\left.\begin{array}{l} m_{d_1} = \frac{y}{x} = -2 \\ m_{d_2} = \frac{y}{x} = \frac{2}{3} \end{array}\right\} \Rightarrow m_{d_1} \cdot m_{d_2} = -\frac{4}{3}$$

**Yanıt / Answer A**

**10.**




$3a + 1 = \tan 135°$

$3a + 1 = -1 \Rightarrow a = -\frac{2}{3}$

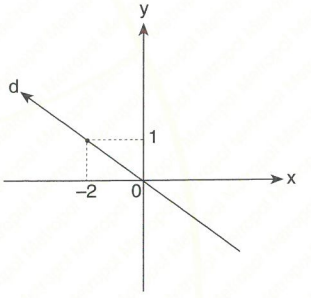
**Yanıt / Answer C**

**11.** $(x_1, y_1) = (-2, 1)$

$(x_2, y_2) = (0, 0)$

$m = \frac{y_1 - y_2}{x_1 - x_2}$

$m = \frac{1-0}{-2-0} = -\frac{1}{2}$




**Yanıt / Answer D**

**12.** $\longrightarrow d_1: 2x - ax + 3y - 5 = 0$

$\longrightarrow d_2: 2x - y + 2 = 0$

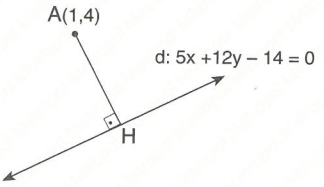
$d_1 \parallel d_2 \Rightarrow$

$\frac{2-a}{2} = \frac{3}{-1} \Rightarrow a = 8$

**Yanıt / Answer E**

**1.** [AH] ⊥ d

**⇒ IAHI = ? br(u)**



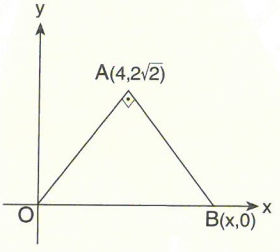

A) 1 B) 2 C) 3 D) 4 E) 5

**2.** [OA] ⊥ [AB]

A(4, $2\sqrt{2}$)

B(x, 0)

**⇒ x = ? br(u)**




A) 2 B) 3 C) 4 D) 5 E) 6

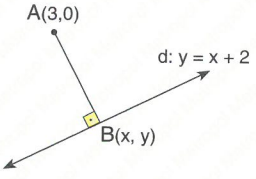
**3.** [AB] ⊥ d

d: y = x + 2,

A(3, 0)

B(x, y)

**⇒ y = ? br(u)**




A) 2 B) $\frac{5}{2}$ C) 3 D) $\frac{7}{2}$ E) 5

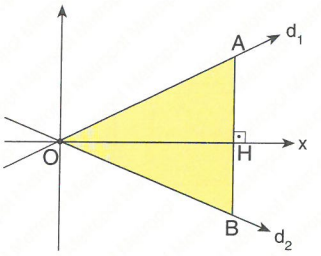
**4.** [AH] ⊥ Ox,

$d_1$: x,

$d_2$: x + 3y = 0

A(AOB) = 24 $br^2(u^2)$

**⇒ IABI = ? br(u)**




A) 8 B) 10 C) 12 D) 14 E) 16

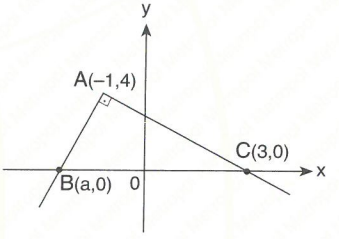
**5.** [BA] ⊥ [CA],

A(–1, 4),

C(3, 0),

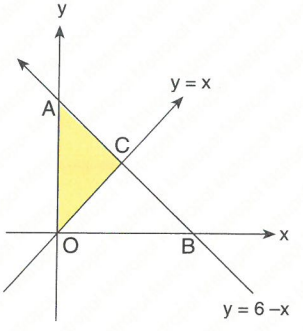
B(a, 0)

**⇒ a = ? br(u)**



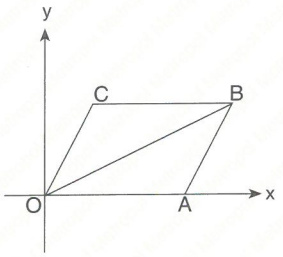

A) –2 B) –3 C) –4 D) –5 E) –6

**6.** **⇒ A(ACO) = ? $br^2(u^2)$**




A) 3 B) 4 C) 6 D) 8 E) 9

**7.**



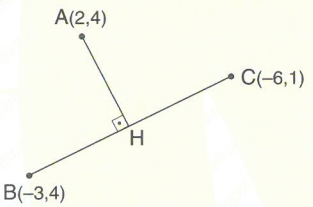

Şekildeki OABC dörtgeni eşkenardır.

OABC is a equilateral quadral in the figure.

A(10, 0)
C(6, 8) } ⇒ **IOBI = ? br(u)**

A) $8\sqrt{5}$ B) $9\sqrt{5}$ C) $10\sqrt{2}$ D) $12\sqrt{3}$ E) 16

**8.** A(2, 4)
B(–3, 4)
C(–6, 1)
[AH] ⊥ [BC]
⇒ **IAHI = ? br(u)**



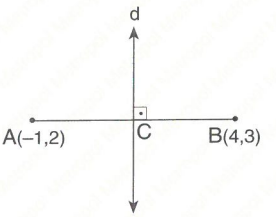

A) $\frac{\sqrt{2}}{2}$ B) $\frac{3\sqrt{2}}{2}$ C) $\frac{5\sqrt{2}}{2}$ D) $\frac{7\sqrt{2}}{2}$ E) $\frac{9\sqrt{2}}{2}$

**9.** A(–1, 4),
B(2, 3),
C(0, b),
IACI = IBCI
⇒ **b = ? br(u)**

A) –1 B) 0 C) 1 D) 2 E) 3

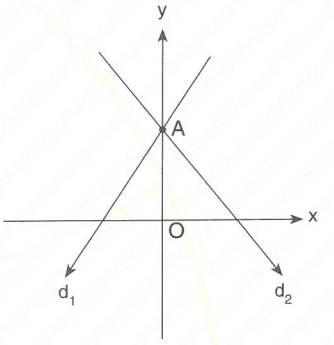
**10.** **IACI = ICBI, d ⊥ [AB] ise d doğrusunun denklemi nedir?**

**What is the equation of the line d?**



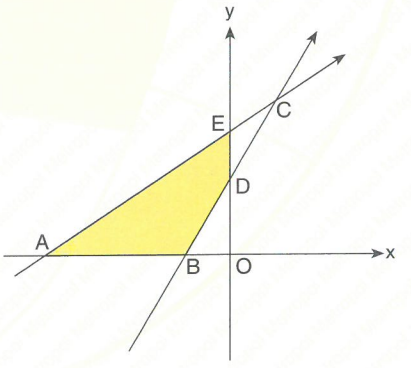

A) 5x – y + 8 = 0 B) 5x + y – 10 = 0
C) 3x – 2y + 4 = 0 D) x – 5y + 20 = 0
E) x + 5y – 5 = 0

**11.** A ∈ $d_1$, $d_2$,
$d_1$: y = 3x + a
$d_2$: y = –2x + 2a – 3
⇒ **a = ?**




A) 1 B) 2 C) 3 D) 4 E) 5

**12.**




A(–5, 0), B(–1, 0), C(1, 6) ⇒ **A(ABDE) = ? br²(u²)**

A) 7 B) 8 C) 9 D) 10 E) 11

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | E | B | E | D | C | A | C | D | B | C | E |

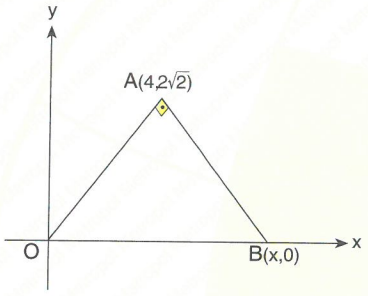
**1.**

$$|AH| = h = \frac{|a \cdot x_1 + b \cdot y_1 + c|}{\sqrt{a^2+b^2}}$$

$$|AH| = \frac{|5 \cdot 1 + 12 \cdot 4 - 14|}{\sqrt{5^2+12^2}} = \frac{39}{13} = 3\,br(u)$$

Yanıt / Answer **C**

**2.**




$$m_{OA} = \frac{2\sqrt{2}}{4} = \frac{\sqrt{2}}{2} = \tan\alpha$$

$$m_{AB} = \frac{2\sqrt{2}-0}{2-x}$$

$$m_{OA} \cdot m_{AB} = -1 \Rightarrow \frac{\sqrt{2}}{2} \cdot \frac{2\sqrt{2}}{4-x} = -1$$

$$\Rightarrow x - 4 = 2$$

$$x = 6\,br(u)$$

Yanıt / Answer **E**

**3.** $[AB] \perp d \Rightarrow m_d \cdot m_{AB} = -1$

$$m_d = 1 \Rightarrow m_{AB} = -1$$

$$y = x + 2$$

$$y = b \Rightarrow x = b - 2$$

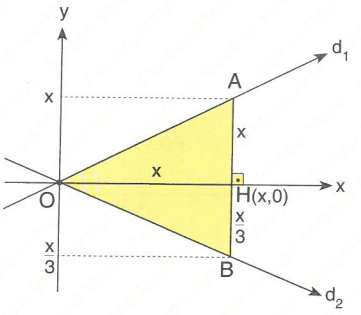
$$m_{AB} = \frac{b-0}{b-2-3} = -1$$

$$2b = 5$$

$$b = \frac{5}{2}\,br(u)$$

Yanıt / Answer **B**

**4.**




$$A(\widehat{AOB}) = \frac{x \cdot (x + \frac{x}{3})}{2} = 24\,br^2(u^2)$$

$$4x^2 = 144 \Rightarrow x = 6\,br(u)$$

$$|AB| = x + \frac{x}{3}$$

$$= 6 + \frac{6}{3} = 8\,br(u)$$

Yanıt / Answer **A**

**5.** $[AC] \perp [AB] \Rightarrow m_{AC} \cdot m_{AB} = -1$

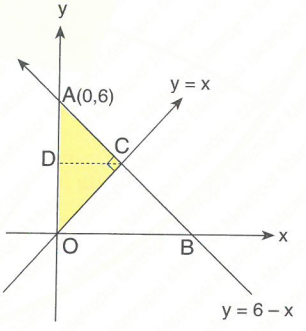
$$m_{AC} = \frac{4-0}{-1-3} = -1$$

$$m_{AB} = \frac{4-0}{-1-a} = \frac{4}{-1-a} = 1$$

$$\Rightarrow -1 - a = 4 \Rightarrow a = -5\,br(u)$$

Yanıt / Answer **D**

**6.**




$$\left.\begin{array}{l} y = x \\ y = 6 - x \end{array}\right\} \Rightarrow \begin{array}{l} 6 - x = x \\ 6 = 2x \end{array}$$

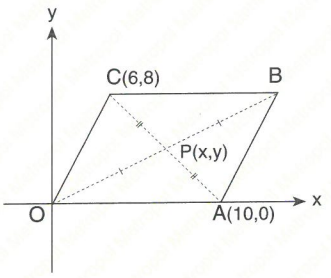
$$\Rightarrow x = 3 \Rightarrow C(3,3)$$

$$\Rightarrow |OC| = 3\sqrt{2} = |AC| \quad [\text{Pythagor}]$$

$$A(\widehat{AOC}) = \frac{3\sqrt{2} \cdot 3\sqrt{2}}{2} = 9\,br^2(u^2)$$

Yanıt / Answer **E**

**7.**




$$\left.\begin{array}{l} x = \dfrac{6+10}{2} = 8\,br(u) \\ y = \dfrac{8+0}{2} = 4\,br(u) \end{array}\right\} \Rightarrow |OP| = \sqrt{8^2+4^2} = 4\sqrt{5}\,br(u)$$

$$|OB| = 2\cdot|OB| = 2\cdot 4\sqrt{5} = 8\sqrt{5}\,br(u)$$

**Yanıt / Answer A**

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**8.** $d = y - y_1 = \left(\dfrac{y_2-y_1}{x_2-x_1}\right)\cdot(x-x_1) \Rightarrow$

$\overleftrightarrow{BC}: y-1 = \dfrac{1-4}{-6-(-3)}\cdot(x+6) \Rightarrow y = x+7$

$\overleftrightarrow{BC}: x-y+7 = 0 \Rightarrow$

$|AH| = \dfrac{|ax_1+by_1+c|}{\sqrt{a^2+b^2}}$

$|AH| = \dfrac{|1\cdot 2-1\cdot 4+7|}{\sqrt{1^2+(-1)^2}} = \dfrac{\sqrt{5}}{\sqrt{2}} = \dfrac{5\sqrt{2}}{2}\,br(u)$

**Yanıt / Answer C**

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**9.** $\left.\begin{array}{l} |AC| = \sqrt{(1-0)^2+(4-b)^2} \\ |BC| = \sqrt{(2-0)^2+(3-b)^2} \end{array}\right\} \Rightarrow b = 2\,br(u)$

$1+4(4-b)^2 = 2^2+(3-b)^2$

$1+16-8b^2 = 4+9-6b+b^2$

$2b = 4$

$b = 2$

**Yanıt / Answer D**

**10.** $d: y-y_1 = m(x-x_1) \Rightarrow$

$m_{AB} = \dfrac{3-2}{4-(-1)} = \dfrac{1}{5} \Rightarrow m_d = -5$

$C\left(\dfrac{4+(-1)}{2}, \dfrac{3+2}{2}\right) \Rightarrow C\left(\dfrac{3}{2}, \dfrac{5}{2}\right)$

$d: y-y_1 = m(x-x_1) \Rightarrow$

$d: y-\dfrac{5}{2} = -5\left(x-\dfrac{3}{2}\right) \Rightarrow 2y-5 = -10x+15$

$\Rightarrow 10x+2y-20 = 0 \Rightarrow 5x+y-10 = 0$

**Yanıt / Answer B**

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**11.** $A \in d_1 \cap d_2$, $A(0, y) \Rightarrow$

$3x + a = -2x + 2a - 3$

$5x = a - 3$

$x = \dfrac{a-3}{5}$

$A(O, y)$ $x = O \Rightarrow O = \dfrac{a-3}{5} \Rightarrow a = 3$

**Yanıt / Answer C**

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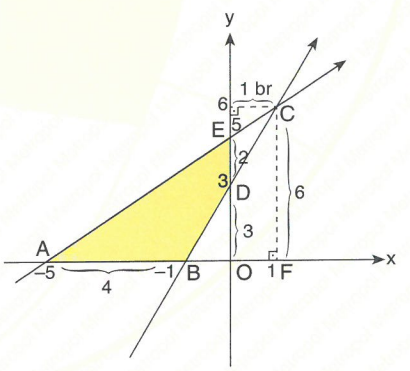
**12.**




$|BO| = |OF| \Rightarrow D(0, 3)$

$|AO| = 5$ br, $|AF| = 6$ br $\Rightarrow$ $|OE| = 5$ br

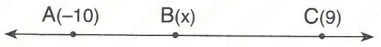
$A(\widehat{ABC}) = \dfrac{6\cdot 4}{2} = 12\,br^2(u^2)$

$A(\widehat{EDC}) = \dfrac{1\cdot 2}{2} = 1\,br^2(u^2)$

$\Rightarrow A(ABDE) = A(\widehat{ABC}) - A(\widehat{EDC}) = 12-1 = 11\,br^2(u^2)$

**Yanıt / Answer E**

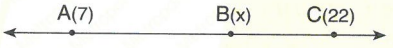
**1.**




$|AC| - |AB| = 14$ br(u) $\Rightarrow$ **x = ?**

A) –5 B) –4 C) –3 D) –2 E) –1

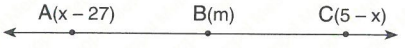
**2.**




$\frac{|AB|}{|AC|} = \frac{2}{3} \Rightarrow x = ?$

A) 15 B) 17 C) 19 D) 21 E) 23

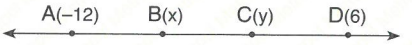
**3.**




$|AB| = |BC| \Rightarrow$ **m = ?**

A) –8 B) –9 C) –10 D) –11 E) –12

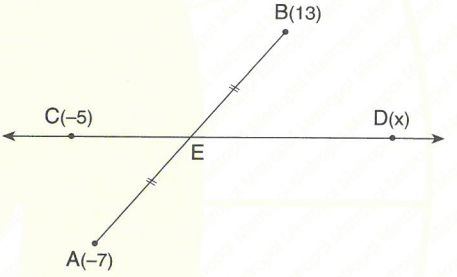
**4.**




$|AB| = |BC| = |CD| \Rightarrow$ **x + y = ?**

A) –8 B) –6 C) –4 D) 4 E) 6

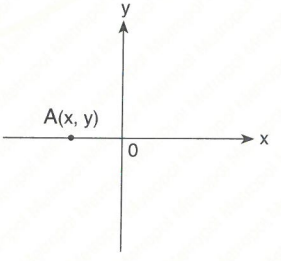
**5.**




$|BE| = |AE|$, $2 \cdot |CE| = |ED| \Rightarrow$ **x = ?**

A) 7 B) 8 C) 9 D) 10 E) 19

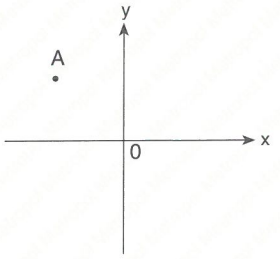
**6.**




A(x, y), A(a – 3, 2a + 4) $\Rightarrow$ **x = ?**

A) –6 B) –5 C) –4 D) –3 E) –2

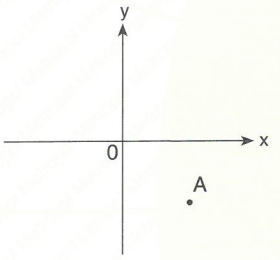
**7.**




$A(-2a+3, -a+4),\ a \in Z \Rightarrow \sum x = ?$

A) –5 B) –3 C) 0 D) 3 E) 5

**8.**



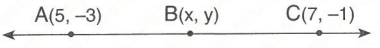

$A(9 - a^2, a - 2) \Rightarrow ? < a < ?$

A) $-3 < a < 2$ B) $-2 < a < 2$

C) $-3 < a < 0$ D) $-3 < a < -2$

E) $-2 < a < 3$

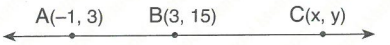
**9.**




$|AB| = |BC| \Rightarrow x + y = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

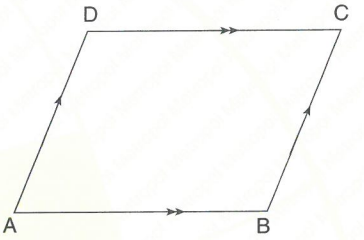
**10.**




$\frac{|CA|}{|CB|} = \frac{4}{3} \Rightarrow y - x = ?$

A) 21 B) 24 C) 28 D) 32 E) 36

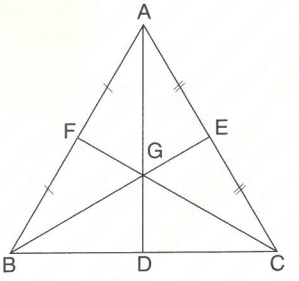
**11.**




[AD] // [BC], [AB] // [DC], A(–2, –6), B(–9, y), C(x, 7), D(5, –3) $\Rightarrow x + y = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

**12.**




$|AE| = |EC|$, $|AF| = |FB|$, $|DB| = |DC|$,

A(3, –1), B(–2, 4), G(4, 2), C(x, y) $\Rightarrow x + y = ?$

A) 8 B) 10 C) 12 D) 14 E) 16

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | D | B | E | B | E | A | D | E | B | D |

# BÖLÜM CHAPTER 14

## TARİHSEL NOT / HISTORICAL NOTE

### René Descartes [1596 – 1650]

Fransız matematikçi, filozof ve bilim adamıydı. Çalışmaları, Newton ve Leibniz tarafından geliştirilen, teğet çizgisi problemine sonsuz küçüklük uygulayan, böylece modern matematiğin bu dalının evrimine izin veren kalkülüsün temelini sağlamıştır. Onun işaret kuralı, aynı zamanda, bir polinomun pozitif ve negatif köklerinin sayısını belirlemek için yaygın olarak kullanılan bir yöntemdir. Ayrıca optik alanına katkılarda bulundu, geometrik konstrüksiyon ve kırılma yasası (Descartes yasası veya daha sıklıkla bilinen Snel yasası) kullanarak bir gökkuşağının açısal yarıçapının 42 derece olduğunu gösterdi.

He was a French mathematician, philosopher, and scientist. His work provided the basis for the calculus developed by Newton and Leibniz, who applied infinitesimal calculus to the tangent line problem, thus permitting the evolution of that branch of modern mathematics. His rule of signs is also a commonly used method to determine the number of positive and negative roots of a polynomial. He also made contributions to the field of optics, he showed by using geometric construction and the law of refraction (also known as Descartes law or more commonly Snell's law) that the angular radius of a rainbow is 42 degrees.

# ÇEMBERİN ANALİTİĞİ
# CIRCLE in ANALYTIC GEOMETRY

**Bu bölüm 23 çözümlü test sorusu ve 24 test sorusu içermektedir.**

**This chapter includes 23 test questions with solutions and 24 test questions.**

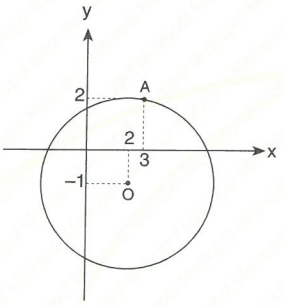
**BÖLÜM / CHAPTER 14**

**ÇEMBERİN ANALİTİĞİ / CIRCLE in ANALYTIC GEOMETRY**

# ÇEMBERİN ANALİTİĞİ
# CIRCLE in ANALYTIC GEOMETRY

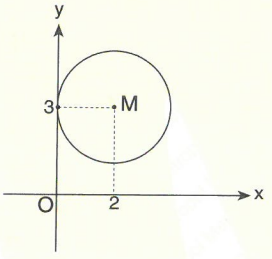


1. O noktası şekildeki çemberin merkezi ise çemberin denklemi nedir?
The point O is center of the circle in the figure. So what is the equation of the circle?



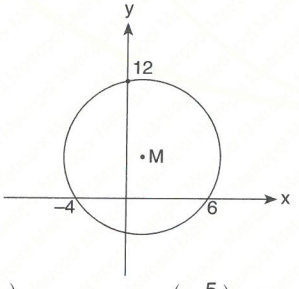

A) $x^2 + y^2 + 2x - 2y = 3$
B) $x^2 + y^2 = 12$
C) $x^2 + y^2 - 4x + 2y = 5$
D) $x^2 + y^2 + 4x - 2y = 10$
E) $x^2 + y^2 - 2x + 4y = 4$

2. M noktası şekildeki çemberin merkezi ise çemberin denklemi nedir?
The point M is center of the circle in the figure. So what is the equation of the circle?



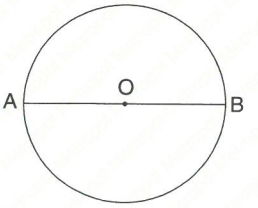

A) $(x - 2)^2 + (y - 3)^2 = 9$
B) $(x + 2)^2 + (y + 3)^2 = 4$
C) $(x - 2)^2 + (y - 3)^2 = 4$
D) $(x - 2)^2 + (y + 3)^2 = 16$
E) $(x + 2)^2 + (y - 3)^2 = 9$

3. M noktası şekildeki çemberin merkezdir.
The point M is center of the circle in the figure.
**M(x, y) = (?, ?)**



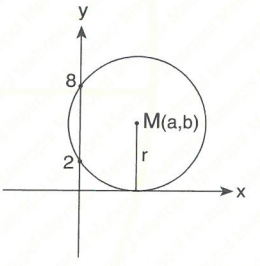

A) $\left(\frac{5}{2}, 5\right)$ B) $\left(\frac{5}{2}, 2\right)$ C) $\left(1, \frac{5}{2}\right)$
D) $(2, 5)$ E) $(1, 5)$

4. A(2, 5), B(–3, –2)
**AB bir çap ise çemberin denklemi nedir?**
AB is a diameter. So what is the equation of the circle in the figure?



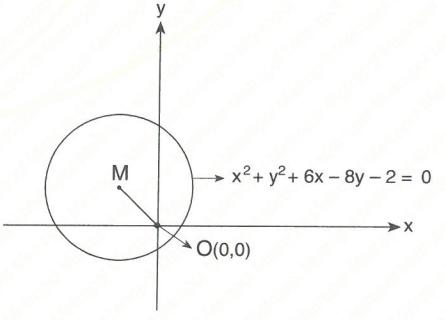

A) $x^2 + y^2 - 2x + 6y - 143 = 0$
B) $2x^2 + 2y^2 - 2x + 6y - 143 = 0$
C) $x^2 + y^2 + x - 3y = 16$
D) $3x^2 + 3y^2 - 3x + 9y - 16 = 0$
E) $3x^2 + 2y^2 + 9x - 3y + 16 = 0$

5. M noktası şekildeki çemberin merkezdir.
The point M is center of the circle in the figure.
**⇒ a + b – r = ?**




A) 4 B) 5 C) 9 D) 14 E) 17

6.

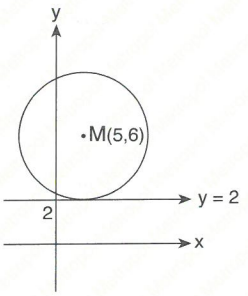



**⇒ |MOI| = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

**7.** **M(5, 6) noktası şekildeki çemberin merkezi ise çemberin denklemi nedir?**

The point M(5, 6) is center of the circle in the figure. So what is the equation of the circle?




A) $(x + 5)^2 + (y - 6)^2 = 9$

B) $(x + 5)^2 + (y - 6)^2 = 16$

C) $(x - 5)^2 + (y - 6)^2 = 16$

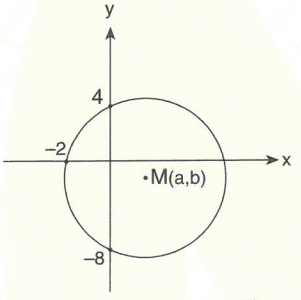
D) $(x - 5)^2 + (y + 6)^2 = 16$

E) $(x + 5)^2 + (y - 6)^2 = 25$

**8.** M noktası şekildeki çemberin merkezdir.

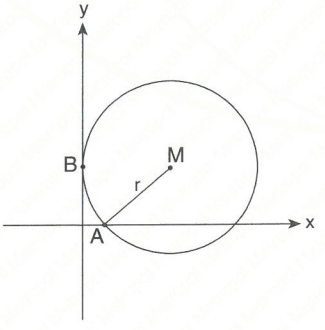
The point M is center of circle in the figure.

M(a, b) ⇒ **a + b = ?**




A) 5 B) 6 C) 7 D) 8 E) 9

**9.** A(2, 0),
B(0, 4)
⇒ **r = ? br(u)**

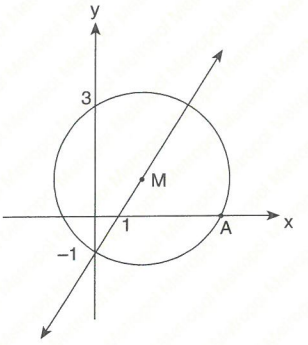



A) 8 B) 6 C) 5 D) 4 E) 3

**10.** M noktası şekildeki çemberin merkezdir.

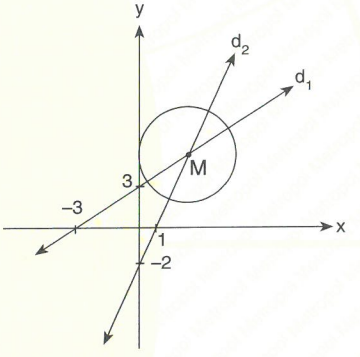
The point M is center of circle in the figure.

A(x, y) ⇒ **x = ?**




A) 5 B) $\sqrt{7} + 2$ C) $\sqrt{7} + 1$ D) $\sqrt{7} + 3$ E) 6

**11.**




M noktası şekildeki çemberin merkezi ise çemberin denklemi nedir?

The point M is center of circle in the figure. So what is the equation of the circle?

A) $(x + 5)^2 + (y + 8)^2 = 25$

B) $(x + 5)^2 + (y + 8)^2 = 64$

C) $(x - 5)^2 + (y - 8)^2 = 25$

D) $(x - 5)^2 + (y - 8)^2 = 64$

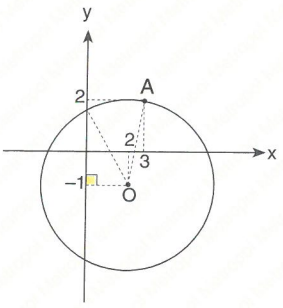
E) $(x - 5)^2 + (y + 8)^2 = 64$



**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | C | E | C | A | E | C | A | C | E | B | C |

**1.**




$A(3,2),\ 0(2,-1) \Rightarrow$

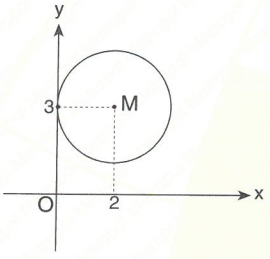
$r = |OA| = \sqrt{1+9} = \sqrt{10}$

$(x-2)^2 + (y+1)^2 = 10$

$x^2 + y^2 - 4x + 2y = 5$

**Yanıt / Answer C**

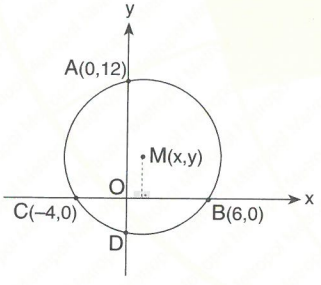
**2.**




$\left.\begin{array}{l} M(2,3) \\ r = 2 \end{array}\right\} \Rightarrow (x-2)^2 + (y-3)^2 = 4$

**Yanıt / Answer C**

**3.**




$x = \dfrac{6+(-4)}{2} = 1$

$|OC| \cdot |OB| = |OA| . |OD|$ [Çemberde kuvvet / power in the circle]

$4 \cdot 6 = 12 \cdot |OD|$

$|OD| = 2\,br(u)$

$y = \dfrac{12-2}{2} = 5\,br(u)$

**Yanıt / Answer E**

**4.**

$A(2,5),\ B(-3,-2) \Rightarrow 0\left(\dfrac{-3+2}{2}, \dfrac{-2+5}{2}\right)$

$\Rightarrow 0\left(-\dfrac{1}{2}, \dfrac{3}{2}\right)$

$2r = \sqrt{7^2+5^2} \Rightarrow r = \dfrac{\sqrt{74}}{4}$

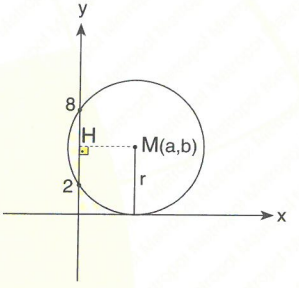
$\left(x+\dfrac{1}{2}\right)^2 + \left(y-\dfrac{3}{2}\right)^2 = \dfrac{74}{4}$

$x^2 + x + y^2 - 3y + \dfrac{5}{2} = \dfrac{74}{4}$

$x^2 + y^2 + x - 3y = 16$

**Yanıt / Answer C**

**5.**




$H(0,b) \Rightarrow b = \dfrac{8+2}{2} = 5 \Rightarrow r = 5$

$(x-a)^2 + (y-5)^2 = r^2$

(0,2) noktası çemberin üzerindedir.

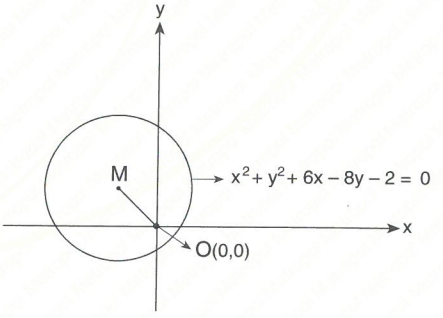
The point (0,2) is on the circle.

$(0-a)^2 + (2-5)^2 = 25 \Rightarrow a^2 = 16 \Rightarrow a = 4$

$\Rightarrow a + b - r = 4 + 5 - 5 = 4$

**Yanıt / Answer A**

**6.**




$x^2 + y^2 + 6x - 8y - 2 = 0$

$x^2 + 6x + 9 - + y^2 - 8y + 16 - 16 - 2 = 0$

$(x+3)^2 + (y-4)^2 = 27 \Rightarrow M(-3,4)$

$|OM| = \sqrt{(-3)^2 + 4^2} = 5$

**Yanıt / Answer E**

**7.** $|MH| = 6$ br (u),

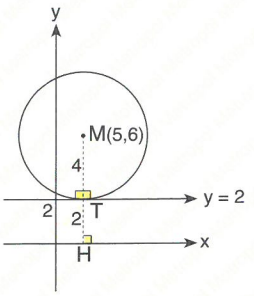
$|TH| = 2$ br (u),

$r = |MT| = 6 - 2 = 4$

$r = 4$ br(u)

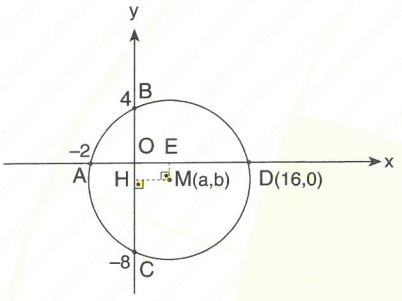
$(x-5)^2 + (y-6)^2 = 4^2$

$(x-5)^2 + (y-6)^2 = 16$




**Yanıt / Answer C**

**8.**




$H(0,b) \Rightarrow b = \dfrac{-8+4}{2} = -2$

$|OB| \cdot |OC| = |OA| \cdot |OD|$

$4 \cdot 8 = 2 \cdot |OD|$

$|OD| = 16\,\text{br}(u)\,|OE| = \dfrac{16+(-2)}{2} = 7\,\text{br}(u)$

$a + b = 7 + (-2) = 5\,\text{br}(u)$

**Yanıt / Answer A**

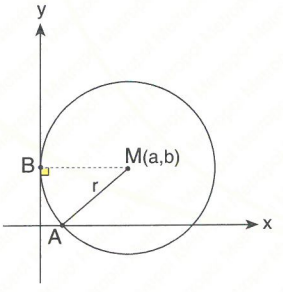
**9.** $\left.\begin{array}{l}[BM] \perp [OB] \\ b = 4, r = |MB| = a\end{array}\right\} \Rightarrow$

$r = |MA| = \sqrt{(a-2)^2 + (4)^2}$

$a = \sqrt{a^2 - 4a + 4 + 16}$

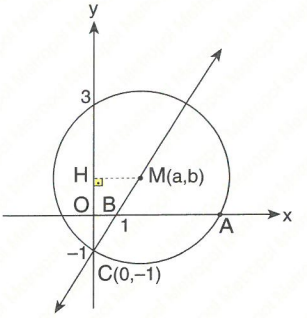
$a^2 = a^2 - 4a + 20$

$a = 5 \Rightarrow r = 5\,\text{br}(u)$




**Yanıt / Answer C**

**10.**




$H(0,b)$,

$\left.\begin{array}{l} b = \dfrac{3+(-1)}{2} = 1 \\ \dfrac{|OB|}{|MH|} = \dfrac{1}{2} \Rightarrow |MH| = a = 2 \end{array}\right\} \Rightarrow M(2,1)$

$\widehat{COB} \sim \widehat{CHM} \Rightarrow \dfrac{|OB|}{|MH|} = \dfrac{|CO|}{|CH|} = \dfrac{1}{2}$

$r = |MC| = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

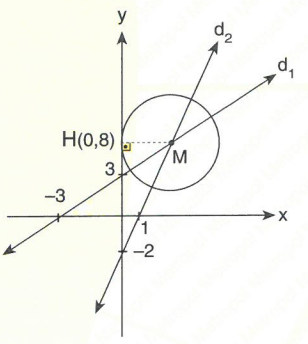
$r = |MC| = \sqrt{(2-0)^2 + (1+1)^2} = 2\sqrt{2}$

$r = |MA| \Rightarrow 2\sqrt{2} = \sqrt{(x-2)^2 + (0-1)^2}$

$\Rightarrow x = \sqrt{7} + 2\,\text{br}(u)$

**Yanıt / Answer B**

**11.**




$M = d_1 \cap d_2$

$\Rightarrow \begin{cases} d_1: \dfrac{x}{-3} + \dfrac{y}{3} = 1 \Rightarrow 2x - 2y + 6 = 0 \\ d_2: \dfrac{x}{1} + \dfrac{y}{-2} = 1 \Rightarrow -2x + y + 2 = 0 \end{cases}$

$$\begin{array}{r} 2x-2y+6=0 \\ +\quad -2x+y+2=0 \\ \hline -y+8=0 \end{array} \Rightarrow y = 8,\ x = 5$$

$\Rightarrow M(5,8), H(0,8)$

$r = |MH| = 5$

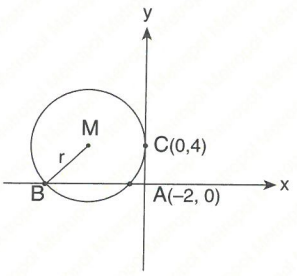
$\Rightarrow (x-5)^2 + (y-8)^2 = 25$

**Yanıt / Answer C**

**1.** M noktası şekildeki çemberin merkezdir.
The point M is center of the circle in the figure.

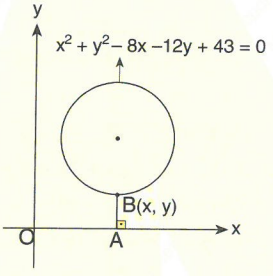
C(0, 4), A(–2, 0) ⇒

**IMBI = r = ? br (u)**



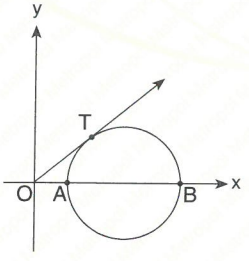

A) 5 B) $\frac{9}{2}$ C) 4 D) $\frac{7}{2}$ E) 3

**2.** [BA] ⊥ [OA]
⇒ **B(x, y) = (?, ?)**



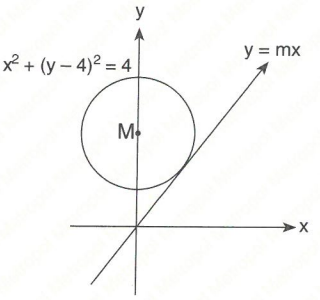

A) (6, 1) B) (4, 3) C) (6, 3) D) (3, 4) E) (6, 4)

**3.** IOTI = 6 br(u),
B(18, 0)
A(x, 0)
⇒ **x = ? br(u)**




A) 1 B) 2 C) 3 D) 4 E) 5

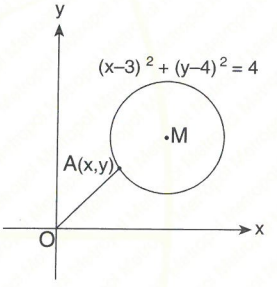
**4.**




M noktası şekildeki çemberin merkezdir.
The point M is center of circle in the figure.
y = mx ⇒ **m = ? br(u)**

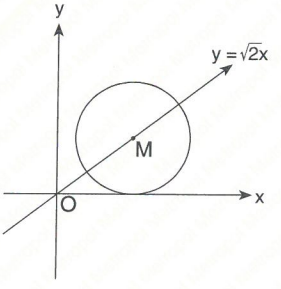
A) $\frac{\sqrt{3}}{3}$ B) $\frac{\sqrt{3}}{2}$ C) 1 D) $\sqrt{3}$ E) 2

**5.** M noktası şekildeki çemberin merkezdir.
The point M is center of the circle in the figure.
A(x, y), O(0, 0)
⇒ **minIAOI = ? br(u)**




A) 1 B) 2 C) 3 D) 4 E) 5

**6.** **M noktası şekildeki çemberin merkezdir. IOMI = $2\sqrt{3}$ br ise çemberin denklemi nedir?**
The point M is center of the circle in the figure. IOMI = $2\sqrt{3}$ u. So what is the equation of the circle?

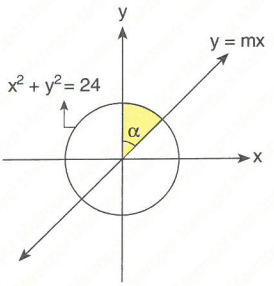



A) $(x - 2)^2 + (y - 2\sqrt{2})^2 = 4$
B) $(x + 2)^2 + (y - 2\sqrt{2})^2 = 4$
C) $(x - 2)^2 + (y - 2\sqrt{2})^2 = 8$
D) $(x + 2)^2 + (y + 2\sqrt{2})^2 = 4$
E) $(x - 2)^2 + (y + 2\sqrt{2})^2 = 4$

**7.** $x^2 + y^2 = 24$,

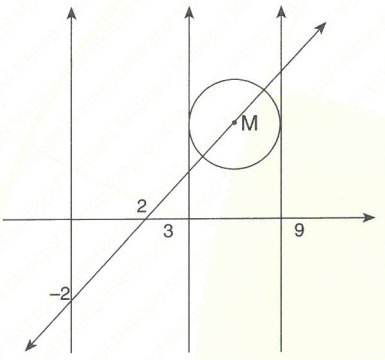
TA / SA = $4\pi$ br$^2$(u$^2$)

$\Rightarrow$ **m = ? br(u)**




A) 1 B) $\frac{\sqrt{3}}{3}$ C) $\sqrt{3}$ D) 2 E) $\sqrt{5}$

**8.**




**M noktası şekildeki çemberin merkezi ise denklemi nedir?**

The point M is center of the circle in the figure. So what is the equation of the circle?

A) $(x - 6)^2 + (y - 4)^2 = 36$

B) $(x + 6)^2 + (y - 4^2 = 36$

C) $(x - 6)^2 + (y + 4)^2 = 9$

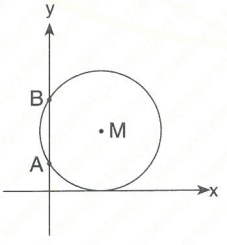
D) $(x - 6)^2 + (y - 4)^2 = 9$

E) $(x - 6)^2 + (y - 4)^2 = 3$

**9.** M noktası şekildeki çemberin merkezdir.

The point M is center of the circle in the figure.

M(2, 6) $\Rightarrow$ **IABI = ?**

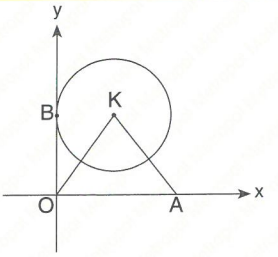



A) $3\sqrt{2}$ B) $4\sqrt{2}$ C) $5\sqrt{2}$ D) $6\sqrt{2}$ E) $8\sqrt{2}$

**10.** IOKI = IKAI = IOAI,

**A(4, 0) ise çemberin denklemi nedir?**

A(4, 0) is center of the circle.What is the equation of the circle in the figure.




A) $(x - 2\sqrt{3})^2 + (y - 2)^2 = 4$

B) $(x - 2)^2 + (y - 2\sqrt{3})^2 = 4$

C) $(x + 2)^2 + (y + 2\sqrt{3})^2 = 4$

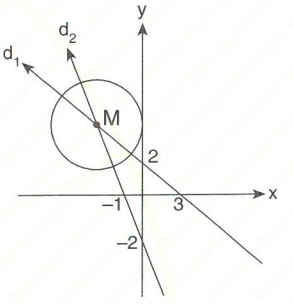
D) $(x - 2)^2 + (y - 2\sqrt{3})^2 = 9$

E) $(x - 2)^2 + (y - 2\sqrt{3})^2 = 16$

**11.** M noktası, şekildeki çemberin merkezdir.

**$d_1 \cup d_2$ = {M} ise çemberin denklemi nedir?**

The point M is center of the circle in the figure. So $d_1 \cup d_2$ = {M} what is the equation of the circle?




A) $x^2 + y^2 + 3x - 4y + 8 = 0$

B) $x^2 + y^2 - 3x + 4y + 8 = 0$

C) $(x + y)^2 + (y - 2)^2 = 9$

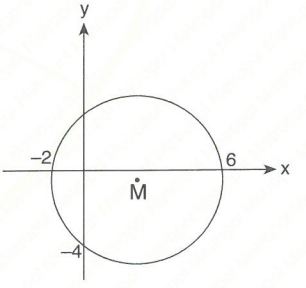
D) $(x + 4)^2 + (y - 5)^2 = 0$

E) $x^2 + y^2 + 6x - 8y + 16 = 0$

**12.** M noktası şekildeki çemberin merkezdir.

The point M is center of the circle in the figure.

$\Rightarrow$ **M(a, b) = (?, ?)**



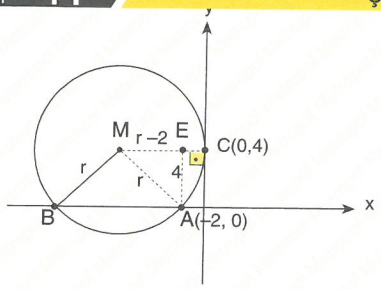

A) $\left(-2, \frac{3}{2}\right)$ B) $\left(2, -\frac{1}{2}\right)$ C) $\left(4, \frac{3}{2}\right)$

D) $\left(-\frac{3}{2}, 2\right)$ E) $\left(\frac{3}{2}, 2\right)$

**YANITLAR / ANSWERS**

**1.**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | B | D | C | C | B | D | E | B | E | B |



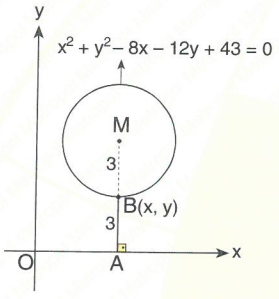

$r^2 = 4^2 + (r-2)^2$

$r^2 = 16 + r^2 - 4r + 4$

$4r = 20 \Rightarrow r = 5$ br(u)

**Yanıt / Answer A**

**2.**

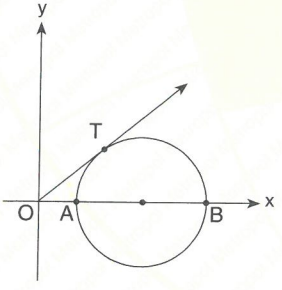



$(x-4)^2 + (y-6)^2 = 9 \Rightarrow M(4, 6)$ , $r = 3$

$\Rightarrow B(4, 3)$

**Yanıt / Answer B**

**3.**




$|OA| = x$, $|OB| = 18$

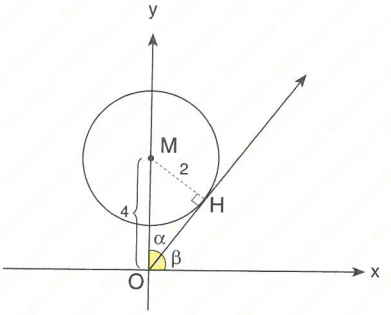
$|OT|^2 = |OA| \cdot |OB|$

$36 = x \cdot 18$

$x = 2$ br(u)

**Yanıt / Answer B**

**4.**




$|OM|^2 = |MH|^2 + |OH|^2$

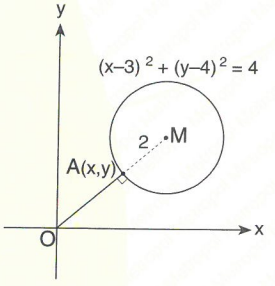
$4^2 = 2^2 + |OH|^2$

$16 = 4 + |OH|^2 \Rightarrow |OH| = 2\sqrt{3}$ br(u)

$m = \tan\beta = \tan(90° - \alpha) = \tan 60 = \sqrt{3}$

**Yanıt / Answer D**

**5.**



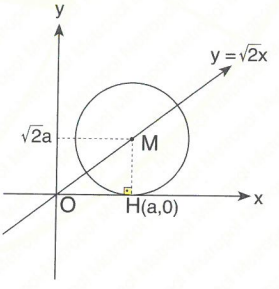

$M(3, 4)$ , $r = 2$ br (u)

$|OM| = \sqrt{3^2 + 4^2}$

$|OM| = 5$ cm $\Rightarrow \min|OA| = 3$ br(u)

**Yanıt / Answer C**

**6.**




$x = a \Rightarrow y = \sqrt{2}\,a$

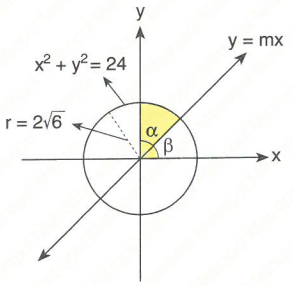
$|OM| = \sqrt{a^2 + 2a^2} = a\sqrt{3} = 2\sqrt{3}$ br(u)

$a = 2$ br(u), $r = |MH| = 2\sqrt{2}$ br(u)

$(x-2)^2 + (y - 2\sqrt{2})^2 = 8$

**Yanıt / Answer C**

**7.**




$x^2 + y^2 = r^2$

$r^2 = 24 \Rightarrow r = 2\sqrt{6}\,br(u)$

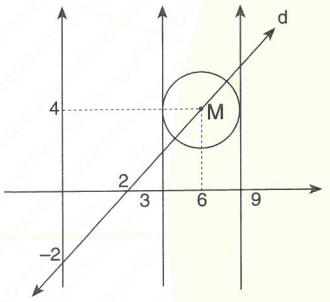
$TA/SA = \dfrac{\pi \cdot r^2 \cdot \alpha}{360^\circ}$

$4\pi = \dfrac{\pi \cdot (2\sqrt{6})^2 \cdot \alpha}{360^\circ}$

$\beta = 30^\circ,\ m = \tan\beta = \dfrac{\sqrt{3}}{3}$

**Yanıt / Answer B**

**8.**



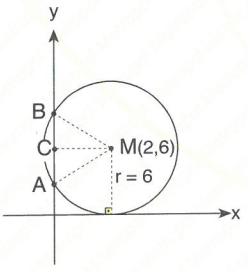

$2r = 9 - 3 = 6 \Rightarrow r = 3$

$\left.\begin{array}{l} d: \dfrac{x}{2} + \dfrac{y}{-2} = 1 \\ d: x - y = 2 \end{array}\right\} \Rightarrow M(6,4),$

$r = 3\ cm \Rightarrow (x-6)^2 + (y-4)^2 = 9$

**Yanıt / Answer D**

**9.**




$|BC| = \sqrt{36-4} = 4\sqrt{2}\,br(u)$ [Pythagor]

$|AB| = 2 \cdot |BC| = 2 \cdot (4\sqrt{2}) = 8\sqrt{2}\ br(u)$

**Yanıt / Answer E**

**10.** $r = |OH| = |HA| = 2\,br(u)$

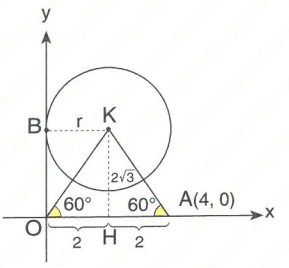
$\perp \widehat{OHK}$ $(30^\circ, 60^\circ, 90^\circ)$

$\Rightarrow |KH| = \sqrt{3} \cdot a$

$K(a, \sqrt{3} \cdot a)$

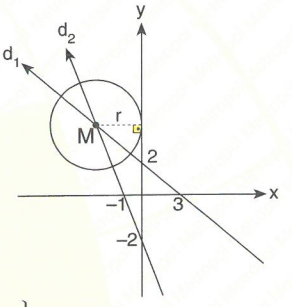
$\left.\begin{array}{l} M(2, 2\sqrt{3}) \\ r = 2\,br(u) \end{array}\right\} \Rightarrow$

$(x-2)^2 + (y - 2\sqrt{3})^2 = 4$




**Yanıt / Answer B**

**11.**



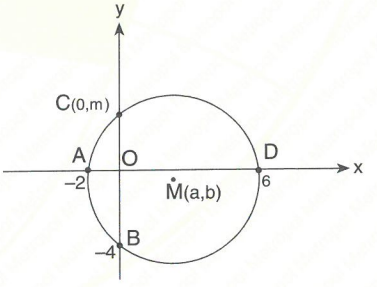

$\left.\begin{array}{l} d_1: \dfrac{x}{3} + \dfrac{y}{2} = 1 \\ d_2: \dfrac{x}{-1} + \dfrac{y}{-2} = 1 \end{array}\right\} \Rightarrow \begin{array}{l} d_1 \cap d_2 = \{M\} \\ M(-3,4), r = 3 \end{array}$

$(x+3)^2 + (y-4)^2 = 9$

$x^2 + 6x + 9 + y^2 - 8y + 16 = 9 \Rightarrow x^2 + 6x + y^2 - 8y + 16 = 0$

**Yanıt / Answer E**

**12.**




$|AO| \cdot |OD| = |OC| \cdot |OB|$ [çemberde kuvvet / power in the circle]

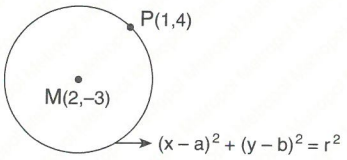
$2 \cdot 6 = |OC| \cdot 4$

$|OC| = 3\,br(u) \Rightarrow m = 3\,br(u)$

$\left.\begin{array}{l} b = \dfrac{3 + (-4)}{2} = -\dfrac{1}{2}\,br(u) \\ a = \dfrac{6 + (-2)}{2} = 2\,br(u) \end{array}\right\} \Rightarrow M\left(2, -\dfrac{1}{2}\right)$

**Yanıt / Answer B**

**1.**




**M(2, –3), P(1, 4), M noktası şekildeki çemberin merkezi ise çemberin denklemi nedir?**

The point M is center of the circle in the figure. So, what is the equation of the circle in the figure?

A) $(x + 2)^2 + (y - 3)^2 = 25$ B) $(x + 2)^2 + (y - 3)^2 = 50$

C) $(x - 2)^2 + (y + 3)^2 = 25$ D) $(x - 2)^2 + (y + 3)^2 = 50$

E) $(x - 2)^2 + (y + 3)^2 = 5\sqrt{2}$

**2.** d: $3x - 4y + 8 = 0$,

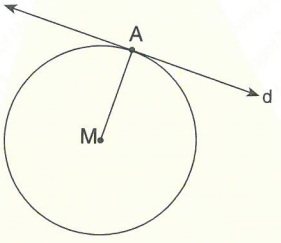
M(2, 1)

M noktası, şekildeki çemberin merkezdir.

**Çemberin denklemi nedir?**

M is center of circle in the figure.

What is the equation of the the circle?

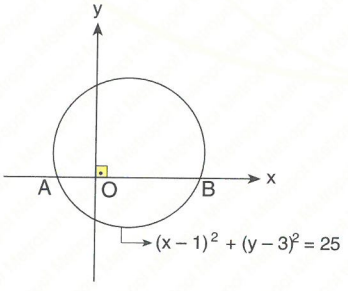



A) $(x + 2)^2 + (y + 1)^2 = 2$ B) $(x - 2)^2 + (y - 1)^2 = 2$

C) $(x - 2)^2 + (y - 1)^2 = 4$ D) $(x + 2)^2 + (y + 1)^2 = 4$

E) $(x - 2)^2 + (y - 1)^2 = \sqrt{2}$

**3.** ⇒ **|AB| = ? br(u)**



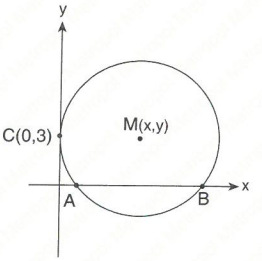

A) 2 B) 4 C) 8 D) 10 E) 12

**4.** M noktası şekildeki çemberin merkezidir.

The point M is center of the circle in the figure.

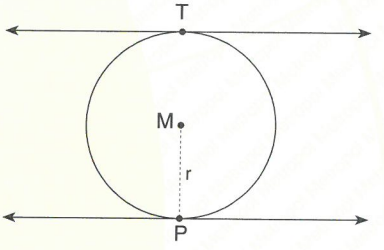
A(1, 0), C(0, 3),

M(x, y) ⇒ **x·y = ?**




A) 12 B) 15 C) 16 D) 18 E) 21

**5.**




M noktası şekildeki çemberin merkezidir.

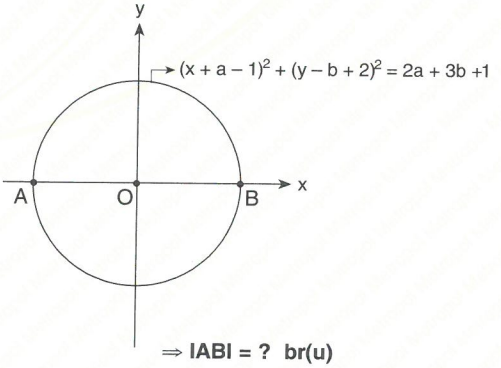
The point M is center of the circle in the figure.

$d_1$: $3x - 4y + 8 = 0$, $d_2$: $4y - 3x + 22 = 0$

⇒ **|MP| = r = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

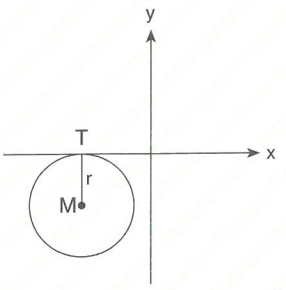
**6.**




⇒ **|AB| = ? br(u)**

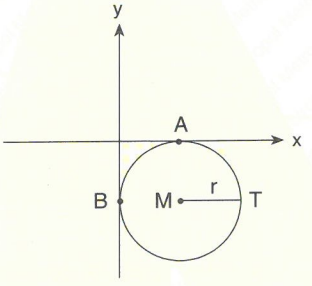
A) 3 B) 4 C) 5 D) 6 E) 7

**7.** M(2a + 1, a + 3)
IMTI = r = 7 br(u),
M(x,y) ⇒ **x + y = ?**



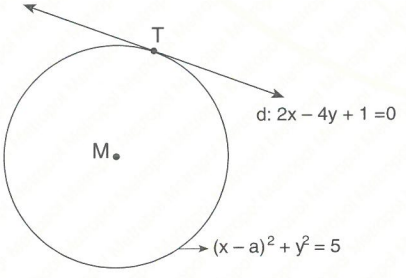

A) –16 B) –18 C) –22 D) –24 E) –26

**8.** IMTI = r = 4 br(u),
M(x, y)
⇒ **x · y = ?**




A) –16 B) –8 C) –4 D) 8 E) 16

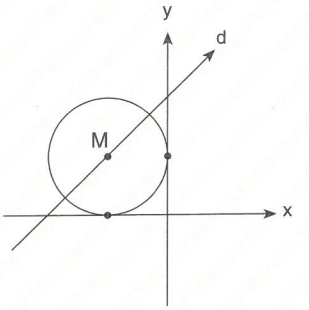
**9.**




⇒ $\sum$ **a = ?**

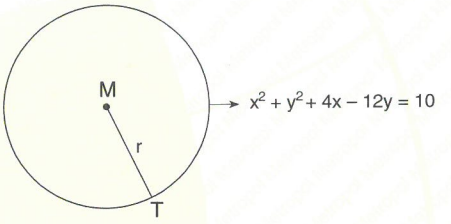
A) –2 B) –1 C) 0 D) 1 E) 2

**10.** d: y – 3x – 12 = 0
M(x,y) ⇒ **x·y = ?**




A) –6 B) –8 C) –9 D) –12 E) –16

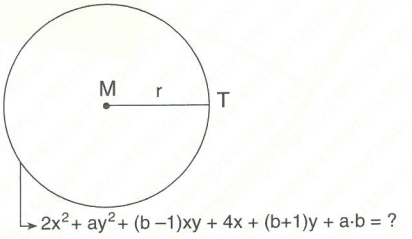
**11.**




⇒ **IMTI = r = ?**

A) $5\sqrt{2}$ B) $6\sqrt{2}$ C) $8\sqrt{2}$ D) $9\sqrt{2}$ E) $10\sqrt{10}$

**12.**




⇒ **IMTI = r = ?**

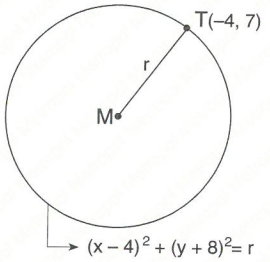
A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) 1 E) 2

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | C | C | B | A | D | E | A | B | C | A | C |

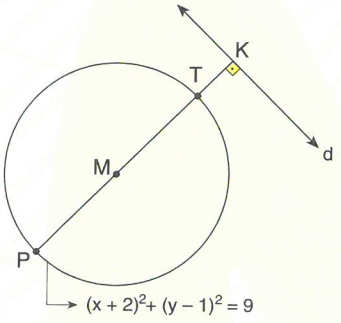
**1.** ⇒ **IMTI = r = ?**

A) 12
B) 14
C) 15
D) 17
E) 18

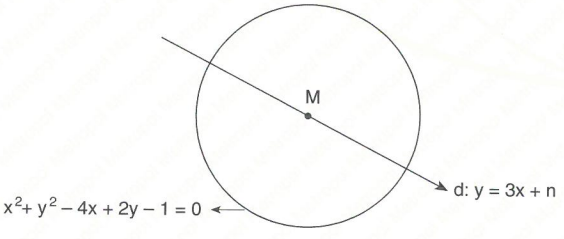



**2.** [PK] ⊥ d,
d : 4x – 3y – 14 = 0
⇒ **IPKI = ? cm**

A) 6
B) 7
C) 8
D) 9
E) 10




**3.**

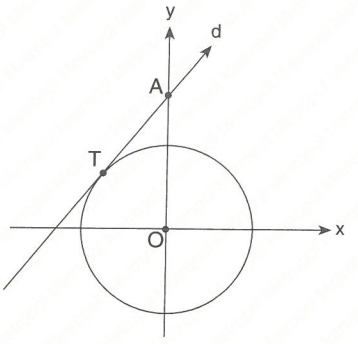



⇒ **n = ?**

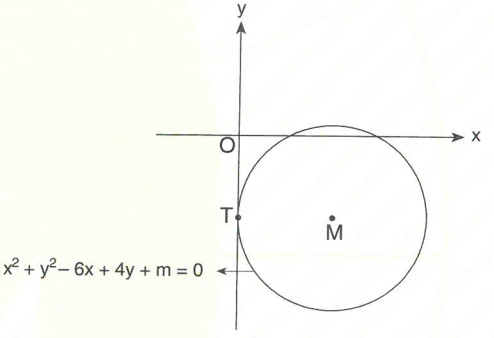
A) –7 B) –5 C) –3 D) 5 E) 7

**4.** T ∈ d,
d : $x^2 + y^2 = 25$,
T(–4, 3), A(0, y)
⇒ **y = ?**

A) 6
B) $\frac{23}{3}$
C) 8
D) $\frac{25}{3}$
E) 10



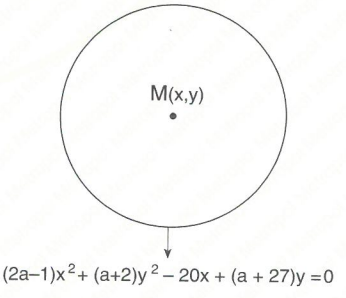

**5.**




T ∈ y ⇒ **m = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

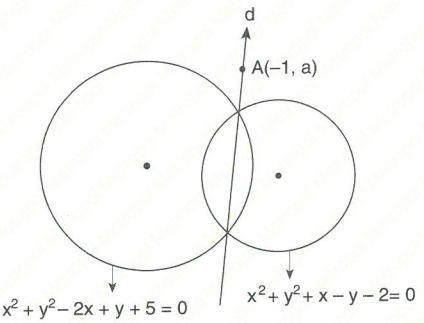
**6.**




⇒ **x·y = ?**

A) –8 B) –6 C) –4 D) 6 E) 8

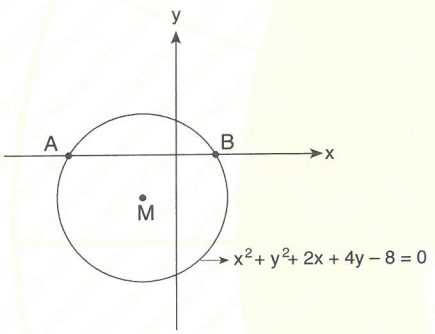
**7.**




$A \in d$, $A(-1, a) \Rightarrow$ **a = ?**

A) –5 B) –3 C) 3 D) 5 E) 7

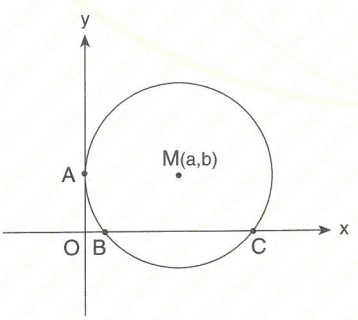
**8.**




$\Rightarrow$ **|AB| = ? br(u)**

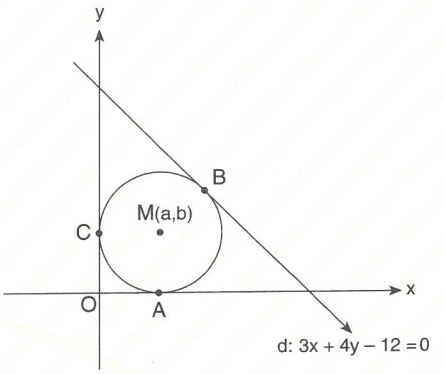
A) 3 B) 4 C) 5 D) 6 E) 7

**9.** B(1, 0), C(9, 0),
A(0, y), M(a, b)
$\Rightarrow$ **a·b = ?**




A) 9 B) 12 C) 15 D) 18 E) 21

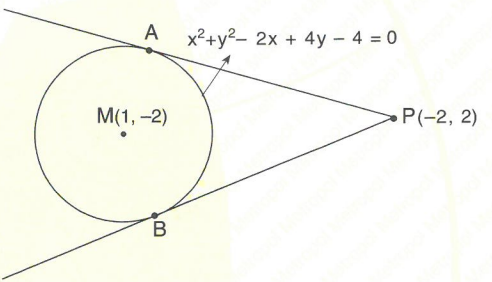
**10.**




$A \in Ox$, $C \in Oy$, $B \in d$, $M(a, b) \Rightarrow$ **a + b = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

**11.**

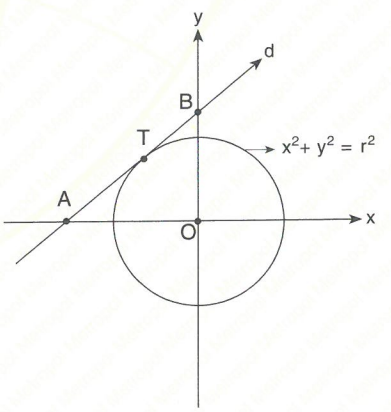



$\Rightarrow$ **|AP| = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

**12.** |AT| = 9 br(u),
|TB| = 4 br(u),
$\Rightarrow$ **r = ?**

A) 4
B) 5
C) 6
D) 7
E) 9




**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | C | A | D | A | B | A | D | C | B | D | C |

# BÖLÜM CHAPTER 15

## TARİHSEL NOT / HISTORICAL NOTE

### Georg Friedrich Bernhard Riemann [1826 – 1866]

Bir Alman matematikçidir. Analiz, sayı teorisi ve diferansiyel geometriye katkıda bulunan, gerçek analiz alanında, integrallerin ilk titiz formülasyonu, Riemann integrali ve Fourier serileri üzerine çalışmaları bilinir. Riemann hipotezinin orijinal ifadesini içeren asal sayma işleviyle ilgili ünlü 1859 tarihli makalesi, analitik sayı teorisindeki en etkili makalelerden biri olarak kabul edilmektedir. Geometriye öncülük eden katkılarıyla Riemann, genel göreliliğin matematiğinin temellerini attı.

He was a German mathematician who made contributions to analysis, number theory, and differential geometry. In the field of real analysis, he is mostly known for the first rigorous formulation of the integral, the Riemann integral, and his work on Fourier series. His famous 1859 paper on the prime-counting function, containing the original statement of the Riemann hypothesis, is regarded as one of the most influential papers in analytic number theory. Through his pioneering contributions to differential geometry, Riemann laid the foundations of the mathematics of general relativity.

# KATI CİSİMLER
# SOLIDS

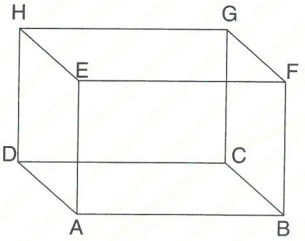
**Bu bölüm 36 çözümlü test sorusu ve 14 test sorusu içermektedir.**

**This chapter includes 36 test questions with solutions and 14 test questions.**

**BÖLÜM / CHAPTER 15**

**KATI CİSİMLER / SOLIDS**

**1.**




ABCDEFGH bir dikdörtgenler prizmasıdır.

ABCDEFGH is a rectangular prism.

A(ADHE) = 12 $cm^2$ , A(EFGH) = 15 $cm^2$

A(ABFE) = 45 $cm^2$ ⇒ **V(ABCDEFGH) = ? $cm^3$**

A) 120 B) 110 C) 96 D) 90 E) 75

**2.** ABCDEG bir dik prizmadır.

ABCDEG is a right prism.

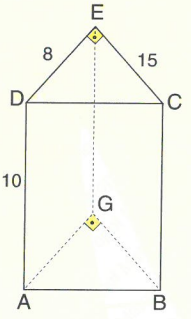
IDEI = 8 cm,

IECI = 15 cm,

IADI = 10 cm

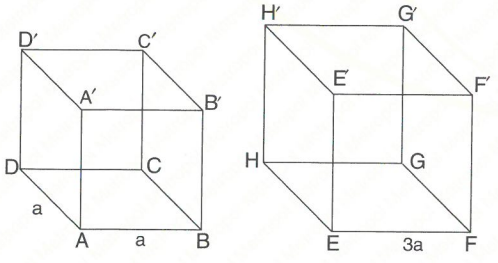
⇒ **Şekildeki yanal alan**

The lateral area = **? $cm^2$**




A) 150 B) 200 C) 250 D) 350 E) 400

**3.**

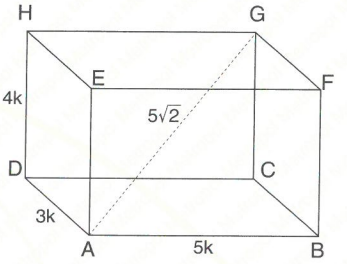



IABI = a cm, IEFI = 3a cm ⇒ **Hacimleri oranı nedir?**

What is the ratio of volumes?

A) $\frac{1}{3}$ B) $\frac{1}{6}$ C) $\frac{1}{9}$ D) $\frac{1}{18}$ E) $\frac{1}{27}$

**4.**




ABCDEFGH bir dikdörtgenler prizmasıdır.

ABCDEFGH is a rectangular prism.

IADI = 3·k, IHDI = 4·k, IABI = 5·k, IAEI = $5\sqrt{2}$ cm

⇒ **A(ABCDEFGH) = ? $cm^2$**

A) 194 B) 141 C) 94 D) 47 E) 34

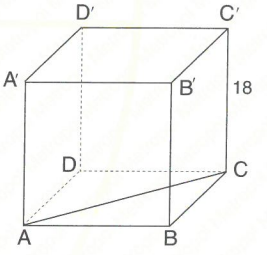
**5.** ABCDA′B′C′D′ bir kare prizmadır.

ABCDA′B′C′D′ is a right prism.

ICC′I = 18 cm,

IACI = $8\sqrt{2}$ cm

⇒ **V(ABCDA′B′C′D′) = ? $cm^3$**



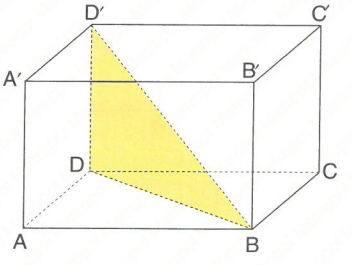

A) 982 B) 1152 C) 1200 D) 1250 E) 1252

**6.** IABI = 6 cm,

IBCI = 8 cm,

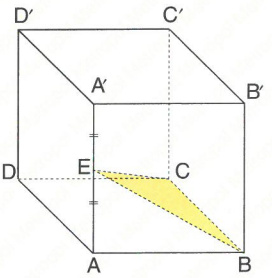
ICC′I = 7 cm

⇒ **A(BDD′) = ? $cm^2$**



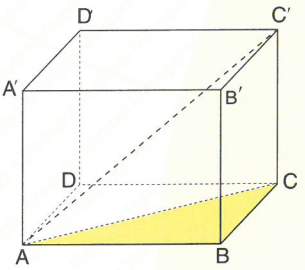

A) 70 B) 68 C) 59 D) 48 E) 35

**7.** IABI = IBCI = IBB′I,
IAEI = IEA′I = 4 cm
$\Rightarrow$ **A($\widehat{ECB}$) = ? cm$^2$**




A) $12\sqrt{5}$ B) $14\sqrt{5}$ C) $16\sqrt{5}$ D) $20\sqrt{5}$ E) $24\sqrt{5}$

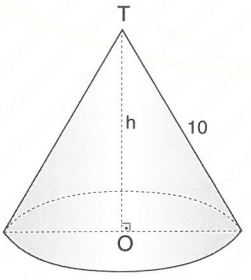
**8.**




IABI = IBCI, A($\widehat{ABC}$) = 36 cm$^2$
V(ABCDA′B′C′D′) = 144 cm$^3$
$\Rightarrow$**IAC′I = ? cm**

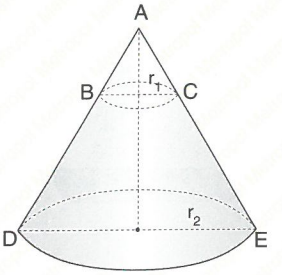
A) $\sqrt{37}$ B) $2\sqrt{37}$ C) $3\sqrt{37}$ D) $2\sqrt{74}$ E) $3\sqrt{74}$

**9.** ITBI = 10 cm,
IOBI = r = 6 cm
$\Rightarrow$ **V(TAOB) = ? $\pi$ cm$^3$**



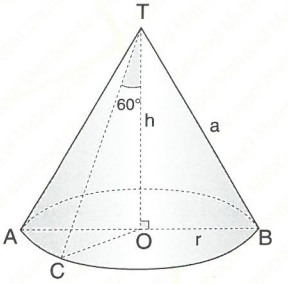

A) 48 B) 64 C) 72 D) 96 E) 108

**10.** $r_1 = \frac{1}{3} \cdot r_2$
$\Rightarrow$ **$\frac{V(ABC)}{V(ADE)}$ = ?**



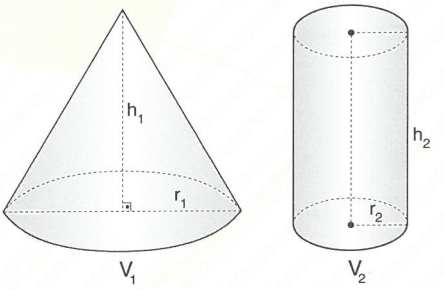

A) $\frac{1}{3}$ B) $\frac{1}{9}$ C) $\frac{2}{9}$ D) $\frac{1}{27}$ E) $\frac{2}{3}$

**11.** $r = 12\sqrt{3}$,
m($\widehat{CTO}$) = 60°
$\Rightarrow$ **a + h = ? cm**




A) $24\sqrt{3}$ B) $32\sqrt{3}$ C) 36 D) $36\sqrt{3}$ E) 48

**12.**



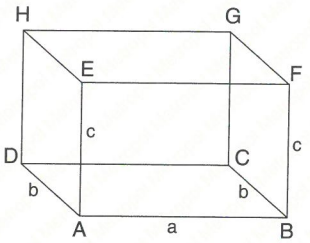

$h_1$ = 6 cm, $r_1$ = 8 cm, $r_2^2$ = 4 cm,
$V_1 = V_2 \Rightarrow$ **$h_2$ = ? cm**

A) 8 B) 16 C) 24 D) 32 E) 40

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E | E | C | B | E | C | B | D | D | C | A |

**1.**




$A(ADHE) = b \cdot c = 12\ cm^2$

$A(EFGH) = a \cdot b = 15\ cm^2$

$A(ABFE) = a \cdot c = 45\ cm^2$

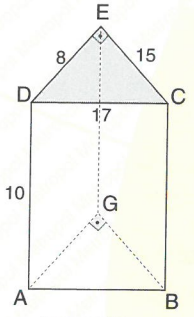
$a^2 \cdot b^2 \cdot c^2 = 2^2 \cdot 3^4 \cdot 5^2$

$V = a \cdot b \cdot c = 2 \cdot 3^2 \cdot 5 = 90$

$V = 90\ cm^3$

**Yanıt / Answer D**

**2.**




$|DC| = \sqrt{8^2 + 15^2}$

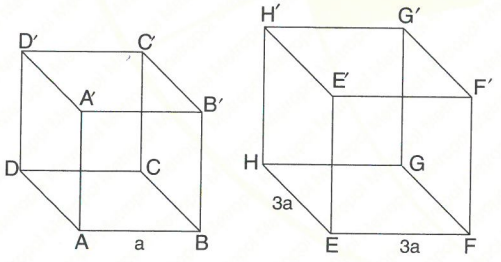
$|DC| = 17\ cm$

$TA / SA = 10 \cdot 8 + 10 \cdot 17 + 10 \cdot 15$

$= 400\ cm^2$

**Yanıt / Answer E**

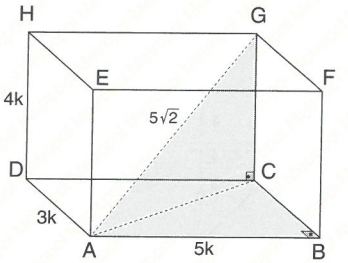
**3.**




$$\frac{V(ABCDA'B'C'D')}{V(EFGHE'F'G'H')} = \frac{a^3}{(3a)^3} = \frac{a^3}{27a^3} = \frac{1}{27}$$

**Yanıt / Answer E**

**4.**




$|AC| = \sqrt{(5k)^2 + (3k)^2}$

$|AC| = \sqrt{34} \cdot k$

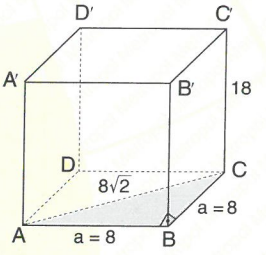
$|GA|^2 = |GC|^2 + |AC|^2$

$50 = 16k^2 + 34k^2 \Rightarrow k = 1$

$A(ABCDEFGH) = 2 \cdot (3 \cdot 4 + 3 \cdot 5 + 4 \cdot 5) = 94\ cm^2$

**Yanıt / Answer C**

**5.**




$a^2 + a^2 = (8\sqrt{2})^2$ [ Pythagor ]

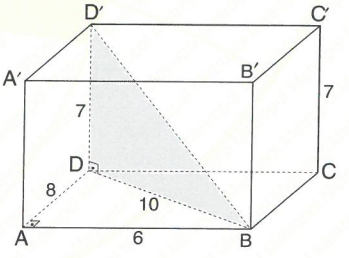
$2a^2 = 128$

$a^2 = 64 \Rightarrow a = 8$

$V(ABCDA'B'C'D') = 8 \cdot 8 \cdot 18 = 1152\ cm^3$

**Yanıt / Answer B**

**6.**



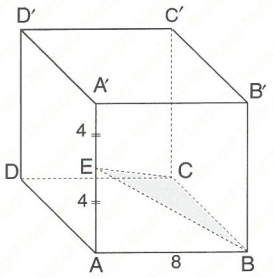

$|DB| = \sqrt{6^2 + 8^2}$

$|DB| = 10\ cm$

$h = |CC'| \Rightarrow A(\widehat{ABD'}) = \frac{10 \cdot 7}{2} = 35\ cm^2$

**Yanıt / Answer E**

**7.**



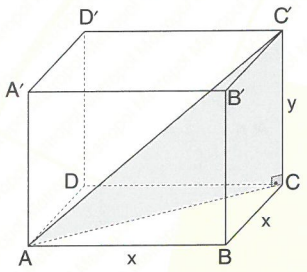

$|EB| = \sqrt{4^2+8^2} = 4\sqrt{5}$ cm [Pythagor]

$[EB] \perp [BC] \Rightarrow$

$A(\widehat{EBC}) = \dfrac{|EB| \cdot |BC|}{2} = \dfrac{4\sqrt{5} \cdot 8}{2} = 16\sqrt{5}$ cm$^2$

**Yanıt / Answer C**

**8.**




$A(\widehat{ABC}) = 36 \text{ cm}^2 = \dfrac{x \cdot x}{2} = 36 \Rightarrow x = 6\sqrt{2}$ cm

$\Rightarrow |AC| = 12$ cm

$V(ABCD'B'C'D') = 144 \text{ cm}^3 \Rightarrow x \cdot x \cdot y = 144$

$\Rightarrow y = 2$ cm

$|AC'| = \sqrt{(2)^2+(12)^2}$

$|AC'| = \sqrt{4+144} = \sqrt{148} = 2\sqrt{37}$ cm

**Yanıt / Answer B**

**9.**

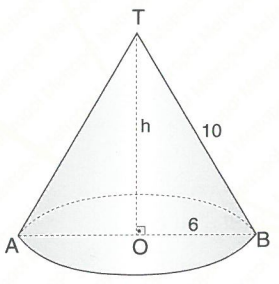
$\perp \widehat{TBO} \Rightarrow$

$h = \sqrt{10^2-6^2} = 8$ cm

$V = \dfrac{1}{3}\pi \cdot r^2 \cdot h$

$= \dfrac{36 \cdot 8}{3}\pi$

$= 96\pi$ cm$^3$




**Yanıt / Answer D**

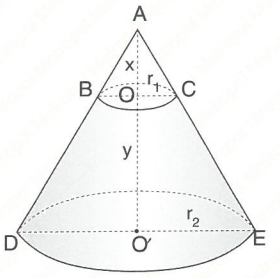
**10.**

$\widehat{AOC} \sim \widehat{AO'E} \Rightarrow$

$\dfrac{x}{x+y} = \dfrac{r_1}{r_2} = \dfrac{1}{3}$

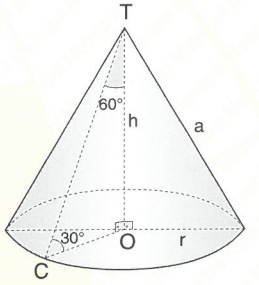
$\dfrac{V(ABC)}{V(ADC)} = \dfrac{\frac{1}{3}n \cdot r_1^2 \cdot x}{\frac{1}{2}n \cdot r_2^2 \cdot (x+y)}$

$= \dfrac{1}{9} \cdot \dfrac{1}{3} = \dfrac{1}{27}$




**Yanıt / Answer D**

**11.**




$\perp \widehat{CTO}$ (30°, 60°, 90°) $\Rightarrow$

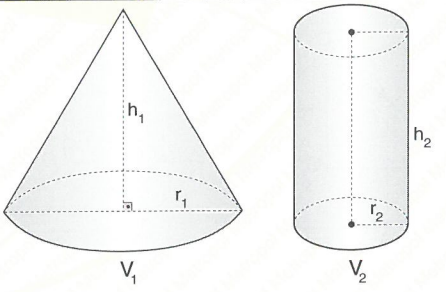
$|CO| = 12\sqrt{3}$ cm $\Rightarrow |TO| = h = 12$ cm

$|TC| = a = 24$ cm

$\Rightarrow a + h = 24 + 12 = 36$ cm

**Yanıt / Answer C**

**12.**




$V_1 = \dfrac{1}{3} \cdot \pi \cdot r_1^2 \cdot h_1$ | $V_2 = \pi r_2 \cdot h_2$

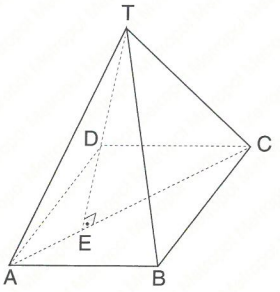
$V_1 = \dfrac{1}{3} \cdot \pi \cdot 8^2 \cdot 6$ | $V_2 = \pi \cdot 4^2 \cdot h_2$

$V_1 = V_2 \Rightarrow 128\pi = 16\pi \cdot h_2$

$h_2 = \dfrac{128}{16} = 8$ cm

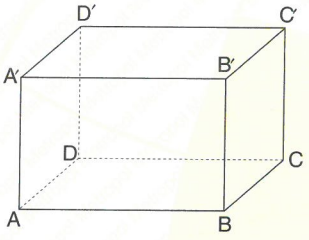
**Yanıt / Answer A**

**1.** [AB] ⊥ [BC],
[BC] ⊥ [CD],
[DA] ⊥ [DC],
[TE] ⊥ [AC],
IABI = IBCI = ICDI = 6 cm
V(ABCD,T) = 144 $cm^3$
⇒ **ITEI = ? cm**




A) 9 B) 12 C) 14 D) 15 E) 18

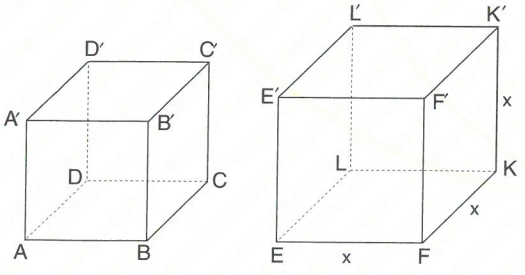
**2.**




$\frac{IABI}{2} = \frac{IBCI}{3} = \frac{ICCI}{4}$ ve (and)
A(ABCDA′B′C′D′) = 468 $cm^2$ ⇒ **V(ABCDA′B′C′D′) = ? $cm^3$**

A) 468 B) 516 C) 648 D) 676 E) 724

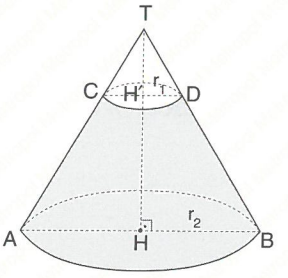
**3.**




IABI = IBCI = ICC′I = 2 cm
V(ABCDA′B′C′D′) = $V_1$ , V(EFKLE′F′K′L′) = $V_2$
IEFI = IFKI = IKK′I = x cm
$V_2 = 8 \cdot V_1$ ⇒ **x = ? cm**

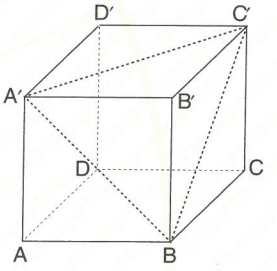
A) 2 B) 4 C) 8 D) 16 E) 32

**4.** ITHI = 10 cm,
IHBI = $r_2$ = 5 cm,
IH′DI = $r_1$ = 2 cm
IACI = $8\sqrt{5}$ cm
⇒ **V(CDAB) = ? $cm^3$**



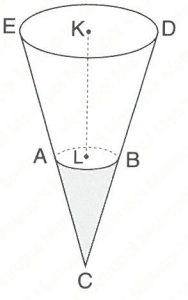

A) $26\pi$ B) $78\pi$ C) $\frac{125\pi}{3}$ D) $\frac{230\pi}{3}$ E) $\frac{250\pi}{3}$

**5.** ABCDA′B′C′D′ bir küptür.
ABCDA′B′C′D′ is a cube.
V(ABCDA′B′C′D′) = 8 $cm^3$
⇒ **V(B′, A′BC′) = ? $cm^3$**



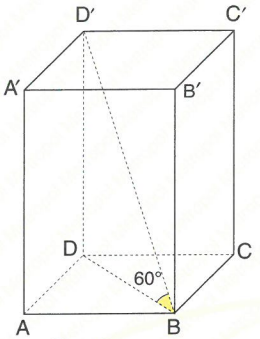

A) $\frac{4}{3}$ B) $\frac{8}{3}$ C) $\sqrt{6}$ D) $\sqrt{3}$ E) 2

**6.** 2 · ICBI = IBDI
⇒ $\frac{V(L,ABC)}{V(K,ECD)}$ = ?



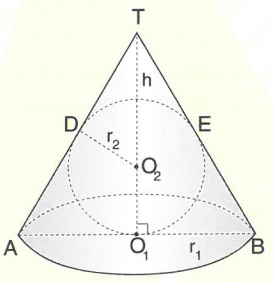

A) $\frac{1}{8}$ B) $\frac{1}{16}$ C) $\frac{1}{27}$ D) $\frac{1}{32}$ E) $\frac{1}{64}$

**7.** ABCD bir karedir.
ABCD is a square.
$|AB| = 3\sqrt{2}$ cm
$\Rightarrow$ **V(ABCDA′B′C′D′) = ?**



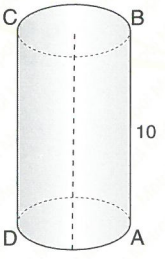

A) 108 B) $108\sqrt{3}$ C) 216 D) $216\sqrt{3}$ E) 432

**8.** $|O_1B| = r_1 = 5$ cm,
$|TO_1| = h = 12$ cm
$\Rightarrow$ **$r_2$ = ? cm**



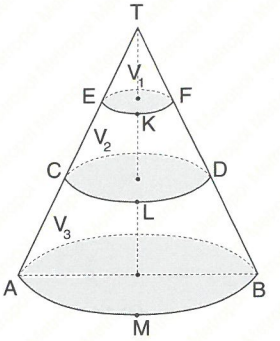

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) $\frac{5}{3}$ D) $\frac{8}{3}$ E) $\frac{10}{3}$

**9.** $|AB| = 10$ cm,
$V = 250\pi$ cm$^3$
$\Rightarrow$ **Şekildeki toplam alan /**
Total area **(*ABCD*) = ?$\pi$ cm$^2$**




A) 100 B) 125 C) 150 D) 175 E) 200

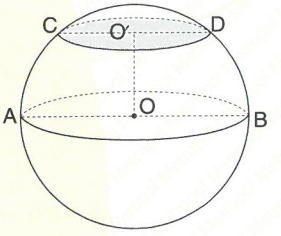
**10.**




$|TE| = |EC| = |CA|$, [EF] // [CD] // [AB],
$V(K, ECDF) = 14$ cm$^3$
$\Rightarrow$ **V(L, CABD) + V(T, EKF) = ? cm$^3$**

A) 21 B) 29 C) 34 D) 40 E) 45

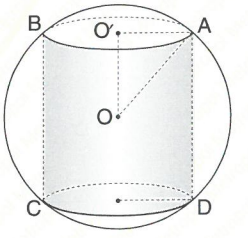
**11.**




$|AO| = 13$ cm, $|OO'| = 12$ cm
$\Rightarrow$ **Şekildeki taralı alan /** The shaded area = **? cm$^2$**

A) $5\pi$ B) $15\pi$ C) $25\pi$ D) $36\pi$ E) $49\pi$

**12.** O noktası şekildeki çemberin merkezidir.
The point O is center of the circle in the figure.
$|OA| = 5$ cm,
$|OO'| = 4$ cm
$\Rightarrow$ **$V_{clinder}$ = ?$\pi$ cm$^3$**

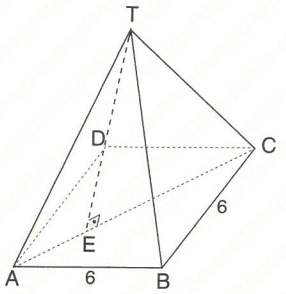



A) 72 B) 64 C) 36 D) 27 E) 16

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B | C | B | B | A | C | D | E | C | D | C | A |

1.



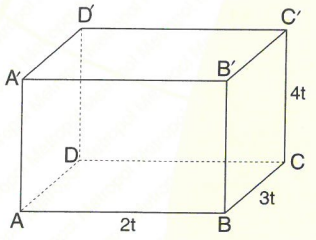

$V(ABCDT) = \frac{1}{3} \cdot |TE| \cdot A(ABCD)$

$144 = \frac{1}{3} \cdot |TE| \cdot 6^2$

$|TE| = 12$ cm

Yanıt / Answer B

2.




$\frac{|AB|}{2} = \frac{|BC|}{3} = \frac{|CC'|}{4} = t$

$2.(2t \cdot 3t + 2t \cdot 4t + 3t \cdot 4t) = 468$

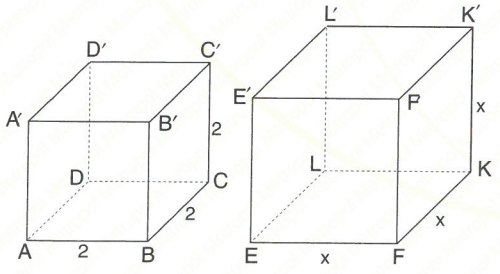
$2 \cdot (6t^2 + 8t^2 + 12t^2) = 468$

$t = 3$ cm

$V = 6 \cdot 9 \cdot 12 = 648$ cm$^3$

Yanıt / Answer C

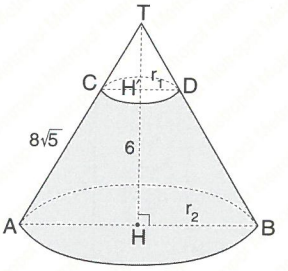
3.




$V_2 = 8 \cdot V_1 \Rightarrow x^3 = 8 \cdot 2^3 \Rightarrow x = 4$ cm

Yanıt / Answer B

4.




$\widehat{TH'D} \sim \widehat{THB}$

$\frac{|HD|}{|HB|} = \frac{|TH'|}{|TH|}$

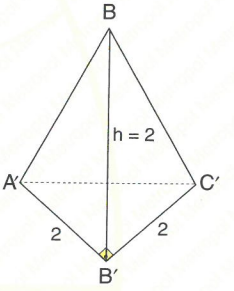
$\frac{|TH'|}{|TH|} = \frac{r_1}{r_2} \Rightarrow \frac{|TH'|}{10} = \frac{2}{5} \Rightarrow |TH'| = 4$ cm

$V(CDAB) = \frac{1}{3} \cdot \pi \cdot (r_2)^2 \cdot |TH| - \frac{1}{3} \cdot \pi \cdot (r_1)^2 \cdot |TH'|$

$= \frac{1}{3} \cdot \pi (250 - 16) = \frac{234\pi}{3} = 78\pi$

Yanıt / Answer B

5. $V = \frac{1}{3} \cdot \left(\frac{2 \cdot 2 \cdot 2}{2}\right) = \frac{4}{3}$

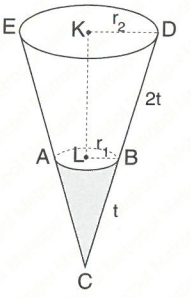



Yanıt / Answer A

6. $\Rightarrow \frac{|CL|}{|CK|} = \frac{r_1}{r_2} = \frac{1}{3}$

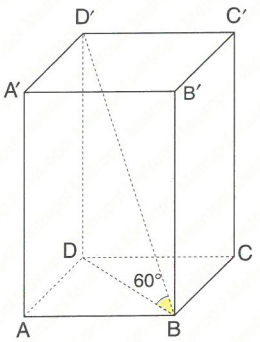
$\frac{V(L,ABC)}{V(K,ECD)} = \frac{\frac{1}{3} \cdot \pi \cdot r_1^2 \cdot |CL|}{\frac{1}{3} \cdot \pi \cdot r_2^2 \cdot |CK|}$

$= \left(\frac{1}{3}\right)^2 \cdot \frac{1}{3} = \frac{1}{27}$




Yanıt / Answer C

**7.**




$\widehat{ABD}$ (45°, 45°, 90°) ⇒

$|AB| = 3\sqrt{2}$ cm ⇒ $|BD| = 6$ cm

$\widehat{DD'B}$ (30°, 60°, 90°) ⇒

$|BD| = 6$ cm ⇒ $|DD'| = 6\sqrt{3}$ cm

$V(ABCDA'B'C'D') = 3\sqrt{2} \cdot 3\sqrt{2} \cdot 6\sqrt{3} = 216\sqrt{3}\ cm^3$

**Yanıt / Answer D**

**8.** $r_1 = 5$ cm, $h = 12$ cm,

$|TB| = \sqrt{5^2 + 12^2}$

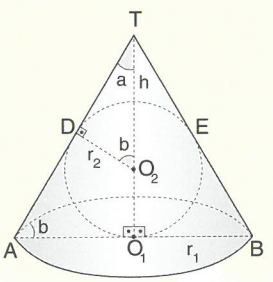
$|TB| = 13$ cm

$\widehat{TO_2D} \sim \widehat{TO_1A}$

$\dfrac{|AO_1|}{|TA|} = \dfrac{|DO_2|}{|TO_2|}$

$\dfrac{5}{13} = \dfrac{r_2}{12 - r_2}$

$r_2 = \dfrac{10}{3}$ cm



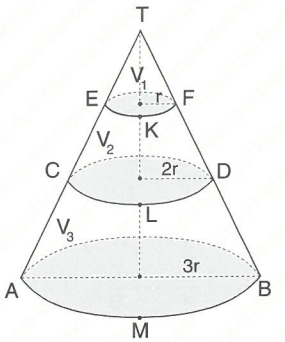

**Yanıt / Answer E**

**9.** $V = \pi \cdot r^2 \cdot h \Rightarrow 250\pi = \pi \cdot r^2 \cdot 10 \Rightarrow r^2 = 25 \Rightarrow r = 5$ cm

$\begin{bmatrix}\text{toplam alan} \\ \text{the total area}\end{bmatrix} = 2 \cdot (\pi r^2) + 2\pi r \cdot h = 50\pi + 100\pi = 150\pi\ cm^2$

**Yanıt / Answer C**

**10.**




$V(K, EFCD) = \frac{1}{3} \cdot \pi \cdot \left((2r)^2 \cdot 2h - r^2 \cdot h\right)$

$14 = \frac{1}{3} \cdot \pi \cdot 7r^2 \cdot h \Rightarrow 2 = \frac{1}{3} \cdot \pi \cdot r^2 \cdot h$

$V(T, EFK) = \frac{1}{3} \cdot \pi \cdot r^2 \cdot h$

$V(L, DCAB) = \frac{1}{3} \cdot \pi\left((3r)^2 \cdot (3h) - (2r)^2 \cdot (2h)\right)$

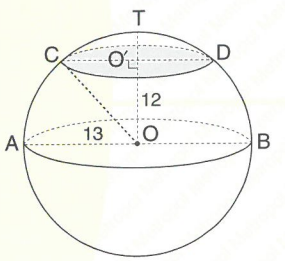
$= \frac{1}{3} \cdot \pi \cdot 19r^2 \cdot h$

$V(K, CDAB) + V(T, EFK) = \frac{1}{3} \cdot \pi \cdot r^2 \cdot h + \frac{1}{3} \cdot \pi \cdot 19r^2 \cdot h$

$= \frac{1}{3} \cdot \pi \cdot 20r^2 \cdot h = 40\ cm^2$

**Yanıt / Answer D**

**11.**

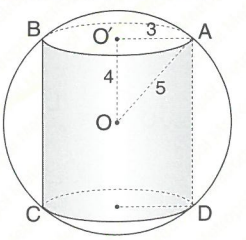



$|OC| = 13$ cm ⇒ $|OC'| = \sqrt{13^2 - 12^2} =$ cm,

taralı alan / the shaded area $= \pi r^2 = \pi \cdot 5^2 = 25\pi\ cm^2$

**Yanıt / Answer C**

**12.**




$V = \pi \cdot r^2 \cdot h = \pi \cdot 3^2 \cdot 8 = 72\pi\ cm^3$

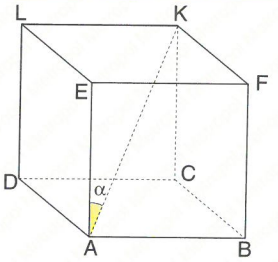
**Yanıt / Answer A**

**1.** ABCDEFKL bir küptür.

ABCDEFKL is a cube.

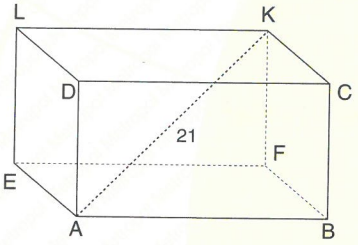
$m(\widehat{EAK}) = \alpha$

$\Rightarrow$ **$\tan\alpha$ = ?**




A) $\frac{1}{2}$ B) $\frac{1}{\sqrt{3}}$ C) $\frac{1}{\sqrt{2}}$ D) $\sqrt{2}$ E) $\sqrt{3}$

**2.**




ABCDEFKL bir dikdörtgenler prizmasıdır.

ABCDEFKL is a rectangular prism.

$3 \cdot |ADI| = 2 \cdot |AEI| = |ABI|$, $|AKI| = 21$ cm

$\Rightarrow$ **A(ABCDEFKL) = ? cm$^2$**

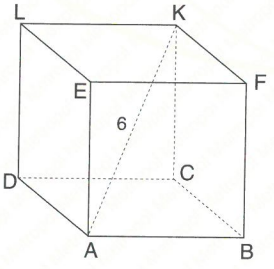
A) 324 B) 458 C) 512 D) 576 E) 648

**3.** ABCDEFKL bir küptür.

ABCDEFKL is a cube.

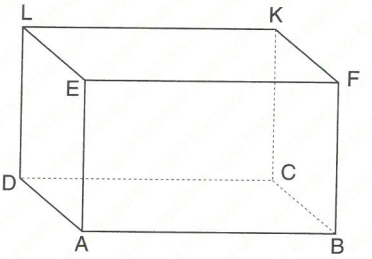
$|AKI| = 6$ cm

$\Rightarrow$ **A(ABCDEFKL) = ? cm$^2$**




A) 48 B) 54 C) 72 D) 108 E) 144

**4.**




ABCDEFKL bir dikdörtgenler prizmasıdır.

ABCDEFKL is a rectangular prism.

A(ABFE) = 10 cm$^2$, A(DAEL) = 5 cm$^2$,

A(DABC) = 8 cm$^2$ $\Rightarrow$ **V(ABCDEFKL) = ? cm$^3$**

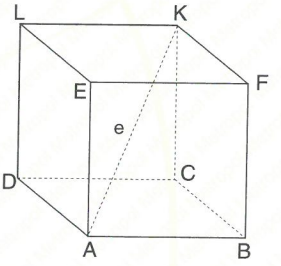
A) 20 B) 36 C) 40 D) 48 E) 54

**5.** ABCDEFKL bir küptür.

ABCDEFKL is a cube.

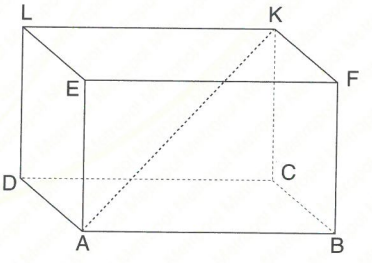
$\frac{V(ABCDEFKL)}{A(ABCDEFKL)} = \frac{2}{3}$

$\Rightarrow$ **|AKI| = e = ?**




A) $2\sqrt{3}$ B) $3\sqrt{2}$ C) $3\sqrt{3}$ D) $4\sqrt{2}$ E) $4\sqrt{3}$

**6.**




ABCDEFKL bir dikdörtgenler prizmasıdır.

ABCDEFKL is a rectangular prism.

$|ABI| = a$, $|CBI| = b$, $|BFI| = c$, $a + b + c = 8$ cm,

$|AKI| = \sqrt{24}$ cm

$\Rightarrow$ **A(ABCDEFKL) = ? cm$^2$**

A) 20 B) 36 C) 40 D) 48 E) 60

**7.** ABCDEFKL bir küptür.

ABCDEFKL is a cube.

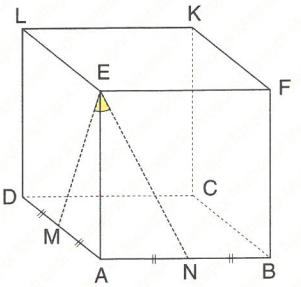
IDMI = IMAI,

IANI = INBI,

IABI = 2 br(u),

$m(\widehat{MEN}) = x$

$\Rightarrow$ **cosx = ?**




A) $\frac{1}{2}$ B) $\frac{\sqrt{3}}{2}$ C) $\frac{\sqrt{3}}{3}$ D) $\frac{2}{3}$ E) $\frac{4}{5}$

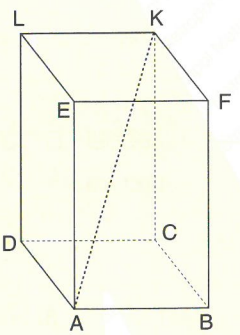
**8.** ABCDEFKL bir kare prizmasıdır.

ABCDEFKL is a square prism.

IABI = $4\sqrt{2}$ cm,

ICKI = 15 cm

$\Rightarrow$ **IAKI = e = ?**



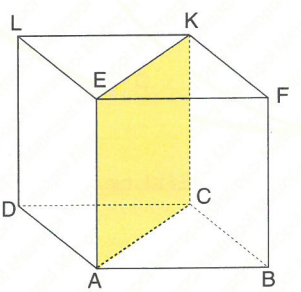

A) 17 B) 18 C) 20 D) 24 E) 25

**9.** ABCDEFKL bir küptür.

ABCDEFKL is a cube.

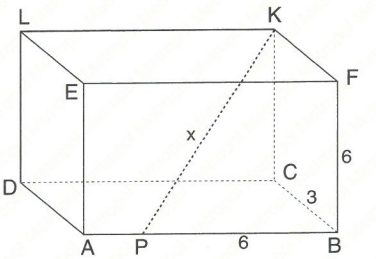
V(ABCDEFKL) = 125 $cm^3$

$\Rightarrow$ **A(ACKE) = ? $cm^2$**




A) $20\sqrt{2}$ B) $25\sqrt{2}$ C) $30\sqrt{2}$ D) $35\sqrt{2}$ E) $40\sqrt{2}$

**10.**




ABCDEFKL bir dikdörtgenler prizmasıdır.

ABCDEFKL is a rectangular prism.

IPBI = 6 cm, IBCI = 3 cm, IBFI = 6 cm

$\Rightarrow$ **IPKI = x = ? cm**

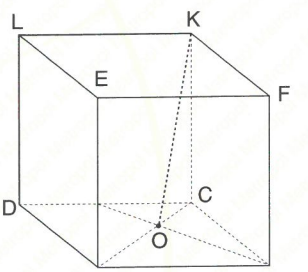
A) $5\sqrt{2}$ B) $5\sqrt{3}$ C) $6\sqrt{2}$ D) $6\sqrt{3}$ E) 9

**11.** ABCDEFKL bir küptür.

ABCDEFKL is a cube.

IOKI = $4\sqrt{6}$ cm

$\Rightarrow$ **V(ABCDEFKL) = ? $cm^3$**




A) 288 B) 324 C) 480 D) 512 E) 576

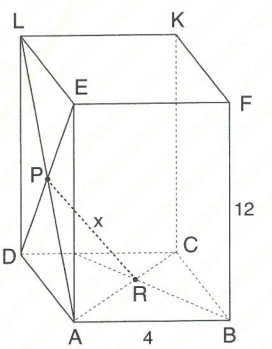
**12.** ABCDEFKL bir dikdörtgenler prizmasıdır.

ABCDEFKL is a rectangular prism.

IABI = 4 cm,

IFBI = 12 cm

$\Rightarrow$ **IPRI = x = ? cm**




A) $6\sqrt{5}$ B) $8\sqrt{5}$ C) $4\sqrt{2}$ D) $5\sqrt{10}$ E) $6\sqrt{10}$

**YANITLAR / ANSWERS**

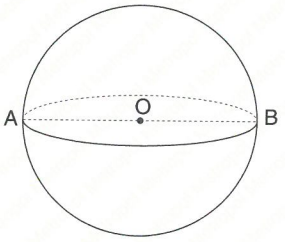
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | E | C | A | E | C | D | A | B | E | D | C |

**1.** (AB, O) küre.

(O, r) sphere.

$V(AB, O) = \frac{4\sqrt{\pi}}{3\pi}$

$\Rightarrow$ **A(AB, O) = ? cm²**




A) 3 B) 4 C) 6 D) $3\pi$ E) $4\pi$

**2.** (AB, O) küre.

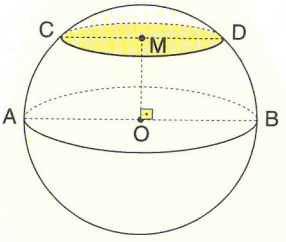
(AB, O) sphere.

$V(AB, O) = x\ cm^3$

$A(AB, O) = x\ cm^2$

$|OM| = 2$ cm

$\Rightarrow$ **TA/SA = ? $\pi$ cm²**




A) $3\pi$ B) $4\pi$ C) $5\pi$ D) $6\pi$ E) $8\pi$

**3.** (AB, O) küre,

CDK,M bir konidir.

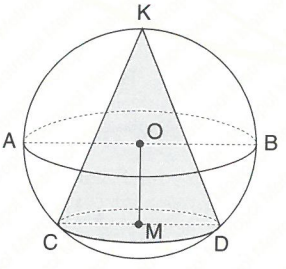
AB, O sphere,

CDK,M is a cone.

$|OB| = 5$ cm,

$|OM| = 4$ cm

$\Rightarrow$ **V(CDK,M) = ?**




A) $9\pi$ B) $18\pi$ C) $24\pi$ D) $27\pi$ E) $36\pi$

**4.** (EF, M) bir küre,

(AKB, O) bir konidir.

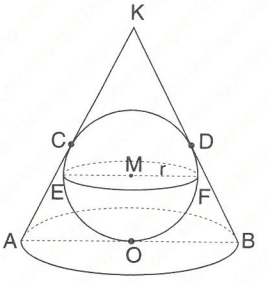
(EF, K) is a sphere,

(AKB, O) is a cone.

$|AK| = 13$ cm,

$|AB| = 10$ cm

$\Rightarrow$ **|MF| = r = ? cm**




A) $\frac{5}{3}$ B) $\frac{8}{3}$ C) $\frac{60}{17}$ D) $\frac{10}{3}$ E) $\frac{16}{3}$

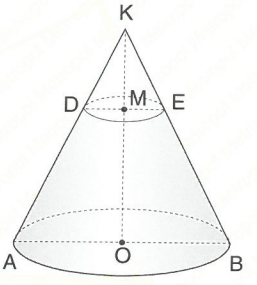
**5.** (AKB, O) bir konidir.

(AKB, O) is a cone.

$|KM| = 2$ cm,

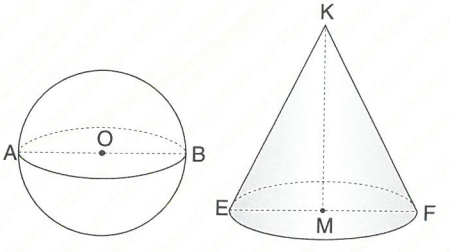
$|MO| = 4$ cm

$\Rightarrow$ $\frac{V(k,DME)}{V(K,ABD)}$ **= ?**




A) $\frac{1}{9}$ B) $\frac{1}{16}$ C) $\frac{1}{18}$ D) $\frac{1}{27}$ E) $\frac{2}{27}$

**6.**




(AB, O) bir küre, / (EFK, O) bir konidir.

(AB, 0) is a shepere, (EFK, O) is a cone.

$|OB| = |MF| = 5$ cm, $V(AB, O) = V(EFK, M)$

$\Rightarrow$ **|KM| = ? cm**

A) 12 B) 16 C) 18 D) 20 E) 24

**7.** $\vec{A} = (3, -2)$

$\vec{B} = (4, 3)$,

$2\vec{A} - \vec{CB} = (5, 2)$

$\Rightarrow |\vec{C}| = ?$

A) $3\sqrt{5}$ B) $3\sqrt{6}$ C) $3\sqrt{10}$ D) $9\sqrt{2}$ E) $9\sqrt{3}$

**8.** $\vec{A} = (3, 2)$,

$\vec{B} = (-1, 5)$

$\vec{C} = (x, 6)$,

$\vec{AB} \,//\, \vec{C} \Rightarrow x = ?$

A) $-8$ B) $-6$ C) $-4$ D) $6$ E) $8$

**9.** $\vec{A} = 2\vec{e_1} - 3\vec{e_2}$

$\vec{B} = -4\vec{e_1} + 5\vec{e_2}$

$\Rightarrow |\vec{AB}| = ?$

A) $5\sqrt{2}$ B) $6\sqrt{2}$ C) $3\sqrt{10}$ D) $10$ E) $12$

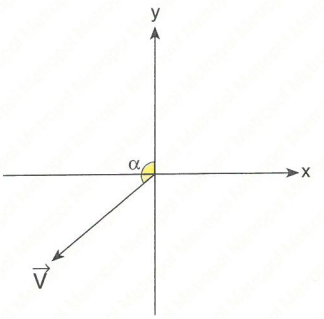
**10.** $\vec{A} + \vec{B} = 2\vec{e_1} + 12\vec{e_2}$

$3\vec{A} - \vec{B} = -10\vec{e_1} + 4\vec{e_2}$

$\Rightarrow |\vec{A}| + |\vec{B}| = ?$

A) $4\sqrt{3}$ B) $5\sqrt{3}$ C) $4\sqrt{5}$ D) $5\sqrt{5}$ E) $6\sqrt{5}$

**11.**




$\vec{V} = -2\sqrt{3} \cdot \vec{e_1} - 2\vec{e_2} \Rightarrow \alpha = ?$

A) $190°$ B) $210°$ C) $223°$ D) $235°$ E) $240°$

**12.** $\vec{A} = 4\vec{e_1} + (x - 1)\vec{e_2}$

$\vec{B} = 6\vec{e_1} - 9\vec{e_2}$

$\vec{A} \,//\, \vec{B} \Rightarrow x = ?$

A) $-5$ B) $-3$ C) $-1$ D) $3$ E) $5$

**13.** $\vec{A} = (x - 2, 6)$

$\vec{B} = (3, -9)$

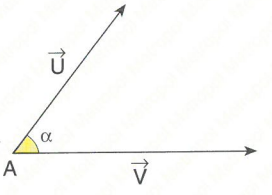
$\vec{A} \perp \vec{B} \Rightarrow x = ?$

A) $-20$ B) $-10$ C) $-5$ D) $10$ E) $20$

**14.** $\vec{U} = (1, 3)$,

$\vec{V} = (-2, 4)$

$\Rightarrow \alpha = ?$




A) $30°$ B) $45°$ C) $60°$ D) $75°$ E) $90°$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| B | C | A | D | D | D | C | A | D |
| **10** | **11** | **12** | **13** | **14** | | | | |
| E | B | A | E | B | | | | |

# BÖLÜM CHAPTER 16

## TARİHSEL NOT / HISTORICAL NOTE

### Georg Friedrich Bernhard Riemann [1826 – 1866]

Bir Alman matematikçidir. Analiz, sayı teorisi ve diferansiyel geometriye katkıda bulunan, gerçek analiz alanında, integrallerin ilk titiz formülasyonu, Riemann integrali ve Fourier serileri üzerine çalışmaları bilinir. Riemann hipotezinin orijinal ifadesini içeren asal sayma işleviyle ilgili ünlü 1859 tarihli makalesi, analitik sayı teorisindeki en etkili makalelerden biri olarak kabul edilmektedir. Geometriye öncülük eden katkılarıyla Riemann, genel göreliliğin matematiğinin temellerini attı.

He was a German mathematician who made contributions to analysis, number theory, and differential geometry. In the field of real analysis, he is mostly known for the first rigorous formulation of the integral, the Riemann integral, and his work on Fourier series. His famous 1859 paper on the prime-counting function, containing the original statement of the Riemann hypothesis, is regarded as one of the most influential papers in analytic number theory. Through his pioneering contributions to differential geometry, Riemann laid the foundations of the mathematics of general relativity.

# VEKTÖRLER
# VECTORS

**Bu bölüm 31 çözümlü test sorusu ve 32 test sorusu içermektedir.**

**This chapter includes 31 test questions with solutions and 32 test questions.**

**BÖLÜM / CHAPTER 16**

**VEKTÖRLER / VECTORS**

**1.** $\vec{A}(x + 2y, 4)$,
$\vec{B}(-1, y - x)$,
$\vec{A} = \vec{B}$
$\Rightarrow$ **x + y = ?**

A) –3 B) –2 C) 0 D) 2 E) 3

**2.** $\vec{A}(-3, 4)$,
$\vec{B}(1, 2)$
$\Rightarrow \vec{A} + \vec{B} = (x, y) = (?, ?)$

A) (–2, 6) B) (2, 6) C) (–2, –6) D) (2, –6) E) (6, 2)

**3.** $\vec{A}(1, 2)$,
$\vec{B}(-3, -2)$,
$\vec{C}(-1, 5)$
$\Rightarrow \vec{AB} + \vec{C} = (x, y) = (?, ?)$

A) (1, 5) B) (5, 1) C) (–1, 5) D) (–5, 1) E) (–5, –1)

**4.** $\vec{A}(2, -1)$,
$\vec{B}(3, 1)$,
$\vec{C}(-1, -4)$,
$a \cdot \vec{A} + b \cdot \vec{B} = \vec{C} \Rightarrow$ **a + b = ?**

A) $\frac{1}{5}$ B) $-\frac{6}{5}$ C) $\frac{3}{5}$ D) $\frac{4}{5}$ E) 1

**5.** $\vec{A}(x - 1, 2)$,
$\vec{B}(3, -4)$,
$\vec{A} \parallel \vec{B}$
$\Rightarrow \|\vec{A}\| = ?$

A) 5 B) $\frac{5}{2}$ C) $\frac{5}{3}$ D) $\frac{5}{4}$ E) 1

**6.** $\vec{A}(3, -1)$,
$\vec{B}(2, a - 1)$,
$\vec{A} \perp \vec{B}$
$\Rightarrow$ **a = ?**

A) 3 B) 5 C) 7 D) 9 E) 11

**7.** $\vec{A}(4, -7)$,
$\vec{B}(-1, x)$,
$\vec{C}(-3, 5)$,
$\vec{AB} \perp \vec{C} \Rightarrow \|\vec{A} + \vec{B} - \vec{C}\| = ?$ **br(u)**

A) $2\sqrt{65}$ B) $\sqrt{130}$ C) $2\sqrt{130}$ D) $\sqrt{195}$ E) 22

**8.** $\vec{A}(2, -5)$,
$\vec{B}(3, 7)$
$\Rightarrow \vec{A} \cdot \vec{B} = ?$

A) –31 B) –29 C) –23 D) –17 E) –13

**9.** $\vec{A}(2, -1)$,

$\vec{B}(-5, 2)$,

$\vec{C}(-3, 5)$,

$\vec{D}(-1, 1)$

$\Rightarrow$ **$\vec{AB} \cdot (\vec{C} + \vec{D}) = ?$ br(u)**

A) 6 B) 16 C) 26 D) 46 E) 56

**10.** $\vec{A}(3, 2)$,

$\vec{B}(x, -5)$,

$\vec{A} \cdot \vec{B} = 2$

$\Rightarrow$ **$\|\vec{AB}\| = ?$ br(u)**

A) 5 B) $5\sqrt{2}$ C) $5\sqrt{3}$ D) 10 E) $5\sqrt{5}$

**11.** $\|\vec{A}\| = 5$,

$\|\vec{B}\| = 6$,

$\vec{A} \cdot \vec{B} = -15$

**$\vec{A}$ ile $\vec{B}$ vektörleri arasındaki açı kaç derecedir?**

What is the angle between vector $\vec{A}$ and $\vec{B}$?

A) 30° B) 45° C) 60° D) 90° E) 120°

**12.** $\|\vec{A}\| = 3$,

$\|\vec{B}\| = 6$

**$\vec{A}$ ile $\vec{B}$ vektörleri arasındaki açı 120° ise $\vec{A} \cdot \vec{B}$ kaçtır?**

The angle between vector $\vec{A}$ and $\vec{B}$ is 120°.

$\vec{A} \cdot \vec{B} = ?$

A) –10 B) –9 C) –8 D) –7 E) –6

**13.** $\|\vec{A} - \vec{B}\| = 5$,

$\|\vec{A}\| = 4$,

$\|\vec{B}\| = 6$

$\Rightarrow$ **$\|\vec{A} + \vec{B}\| = ?$ br(u)**

A) 36 B) $3\sqrt{5}$ C) $\sqrt{59}$ D) 8 E) $\sqrt{79}$

**14.** $\vec{A} = (\sqrt{3}, a)$,

$\vec{B} = (0, a)$

**$\vec{A}$ ile $\vec{B}$ vektörleri arasındaki açı 60° ise $\sum a$ kaçtır?**

The angle between $\vec{A}$ and $\vec{B}$ is 60°. So $\sum a = ?$

A) –1 B) 0 C) 1 D) 2 E) 3

**15.** $\vec{A} = [3 - a, 2]$,

$\vec{B} = [3a - 1, -4]$

$\vec{A} \parallel \vec{B} \Rightarrow$ **a = ?**

A) 2 B) 1 C) 0 D) –3 E) –5

**16.** $\vec{U} = [a + 1, -2]$,

$\vec{V} = [-2, 6]$,

$\vec{U} \perp \vec{V} \Rightarrow$ **a = ?**

A) –8 B) –7 C) $-\frac{5}{2}$ D) $\frac{7}{2}$ E) 9

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| B | A | D | B | B | C | C | B | D |
| **10** | **11** | **12** | **13** | **14** | **15** | **16** | | |
| B | E | B | E | B | E | B | | |

**1.** $\vec{A} = \vec{B} \Rightarrow \begin{cases} x + 2y = 1 \\ y - x = 4 \end{cases}$

$$\begin{array}{r} x + 2y = -1 \\ + \quad y - x = 4 \\ \hline 3y = 3 \Rightarrow y = 1 \end{array}$$

$y = 1 \Rightarrow x = -3$

$\Rightarrow x + y = 1 + (-3) = -2$

Yanıt / Answer **B**

**2.** $\vec{A} + \vec{B} = (-3 + 1, 4 + 2) = (-2, 6)$

Yanıt / Answer **A**

**3.** $\vec{A}(1, 2)$

$\vec{B}(-3, -2)$

$\overrightarrow{AB} = (-3 - 1, -2 - 2)$

$\overrightarrow{AB} = (-4, -4)$

$\overrightarrow{AB} + \vec{C} = (-4 + (-1), -4 + 5)$

$= (-5, 1)$

Yanıt / Answer **D**

**4.** $\vec{A}(2, -1)$

$\vec{B}(3, 1)$

$\vec{C}(-1, -4)$

$a \cdot \vec{A} + b \cdot \vec{B} = \vec{C} \Rightarrow (2a, -a) + (3b, b) = (-1, -4)$

$\Rightarrow (2a + 3b, -a + b) = (-1, 4)$

$$\begin{array}{r} 2a + 3b = -1 \\ 2/ \quad -a + b = -4 \\ \hline 5b = 7 \Rightarrow b = \frac{7}{5} \end{array}$$

$a = b - 4 = \frac{7}{5} - 4 = -\frac{13}{5}$

$a + b = -\frac{13}{5} + \frac{7}{5} = -\frac{6}{5}$

Yanıt / Answer **B**

**5.** $\vec{A} // \vec{B} \Rightarrow \frac{x-1}{2} = \frac{3}{-4} \Rightarrow x = -\frac{1}{2}$

$\vec{A}\left(-\frac{3}{2}, 2\right) \Rightarrow |\vec{A}| = \sqrt{\left(-\frac{3}{2}\right)^2 + 2^2}$

$= \sqrt{\frac{9}{4} + 4} + \sqrt{\frac{25}{4}} = \frac{5}{2}$

Yanıt / Answer **B**

**6.** $\vec{A} \perp \vec{B} = \vec{A} \cdot \vec{B} = 0$

$3 \cdot 2 + (-1) \cdot (a - 1) = 0$

$-a + 1 + 6 = 0 \Rightarrow a = 7$

Yanıt / Answer **C**

**7.** $\overrightarrow{AB} = (-1 - 4, x - (-7) = (-5, x + 7)$

$\overrightarrow{AB} \perp \vec{A} \Rightarrow \overrightarrow{AB} \cdot \vec{A} = 0$

$\Rightarrow (-5, x + 7) \cdot (-3, 5) = 0$

$15 + 5(x + 7) = 0 \Rightarrow x = -10$

$\vec{A} + \vec{B} - \vec{C} = (4 + (-1) - (-3), -7 + (-10) - 5)$

$= (6, -22)$

$\|\vec{A} + \vec{B} - \vec{C}\| = \sqrt{6^2 + (-22)^2} = 2\sqrt{130}$ br(u)

Yanıt / Answer **C**

**8.** $\left.\begin{array}{l} \vec{A}(2, -5) \\ \vec{B}(3, 7) \end{array}\right\} \vec{A} \cdot \vec{B} = 2 \cdot 3 + (-5) \cdot 7 = -29$

Yanıt / Answer **B**

**9.** $\overrightarrow{AB} = (-7, 3)$

$\vec{C} + \vec{D} = (-4, 6)$

$\overrightarrow{AB} \cdot (\vec{C} + \vec{D}) = (-7)\cdot(-4) + 3\cdot 6$

$= 28 + 18 = 46$ br(u)

**Yanıt / Answer D**

---

**10.** $\left.\begin{array}{l}\vec{A}(3, 2)\\ \vec{B}(x, -5)\end{array}\right\} \Rightarrow \vec{A}\cdot\vec{B} = 3.x - 10 = 2 \Rightarrow x = 4$

$\overrightarrow{AB}\ (1, -7) \Rightarrow$

$|\overrightarrow{AB}|\ \sqrt{1^2 + (-7)^2} = \sqrt{50} = 5\sqrt{2}$ br(u)

**Yanıt / Answer B**

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**11.** $\vec{A}\cdot\vec{B} = |\vec{A}|\cdot|\vec{B}|\cdot\cos\alpha$

$-15 = 5\cdot 6\cdot\cos\alpha \Rightarrow \cos\alpha = -\frac{1}{2} \Rightarrow \alpha = 120°$

**Yanıt / Answer E**

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**12.** $\vec{A}\cdot\vec{B} = |\vec{A}|\cdot|\vec{B}|\cdot\cos 120°$

$\vec{A}\cdot\vec{B} = 3\cdot 6\left(-\frac{1}{2}\right) = -9$

**Yanıt / Answer B**

---

**13.** $|\vec{A} - \vec{B}|^2 = 25 \Rightarrow$

$< \vec{A} - \vec{B}, \vec{A} - \vec{B} > = 25$

$< \vec{A}, \vec{A} > + < \vec{B}, \vec{B} > - 2 < \vec{A}\cdot\vec{B} > = 25$

$|\vec{A}|^2 + |\vec{B}|^2 - 2 < \vec{A}\cdot\vec{B} > = 25$

$2\cdot(\vec{A}\cdot\vec{B}) = 27$

$\|\vec{A} + \vec{B}\| = < \vec{A} + \vec{B}, \vec{A} + \vec{B} >$

$= |\vec{A}|^2 + |\vec{B}|^2 + 2\vec{A}\cdot\vec{B} = 16 + 36 + 27 = 79$

$\|\vec{A} + \vec{B}\| = \sqrt{79}$ br(u)

**Yanıt / Answer E**

---

**14.** $\vec{A}(\sqrt{3}, a) \Rightarrow |\vec{A}| = \sqrt{3 + a^2}$

$\vec{B}(0, a) \Rightarrow |\vec{B}| = |a|$

$\vec{A}\cdot\vec{B} = |\vec{A}|\cdot|\vec{B}|\cdot\cos\alpha$

$a^2 = \sqrt{3 + a^2}\cdot|a|\cdot\cos 60°$

$2a^2 = |a|\sqrt{3 + a^2}$

$4a^4 = a^2(3 + a^2)$

$3a^4 - 3a^2 = 0 \Rightarrow 3a^2(a^2 - 1) = 0 \Rightarrow \begin{cases} a = 0 \\ a = 1 \\ a = -1 \end{cases}$

$\sum a = 0 + 1 + (-1) = 0$

**Yanıt / Answer B**

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**15.** $\vec{A} \,//\, \vec{B} \Rightarrow \frac{3 - a}{3a - 1} = \frac{2}{-4} \Rightarrow a = -5$

**Yanıt / Answer E**

---

**16.** $\vec{U} \perp \vec{V} \Rightarrow -2(a + 1) - 12 = 0 \Rightarrow a = -7$

**Yanıt / Answer B**

**1.** $\vec{A} = (\cos x, \sin x)$,

$\vec{B} = (\sin x, \cos x)$,

$< \vec{A} \cdot \vec{B} > = \frac{\sqrt{2}}{2}$

$\Rightarrow$ **x = ?**

A) 15° B) 22,5° C) 30° D) 37,5° E) 45°

**2.** $\vec{A} = (x + y, 2x)$

$\vec{B} = (x + y, -2y)$

$\vec{A} \cdot \vec{B} = 64$

$\Rightarrow$ **|x – y| = ?**

A) 4 B) 6 C) 8 D) 16 E) 12

**3.** $\vec{A} = (2x + y, 2y + x, k)$

$\vec{B} = (x, y, 4)$

$\vec{A} \,//\, \vec{B} \Rightarrow$ **k = ?**

A) 2 B) 4 C) 6 D) 8 E) 12

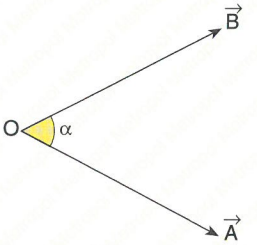
**4.** $\left.\begin{array}{l} \vec{A} - 2\vec{B} = (5, -8) \\ \vec{A} + \vec{B} = (14, 4) \end{array}\right\} \Rightarrow |\vec{B}| = ?$

A) 3 B) 4 C) 5 D) 6 E) 7

**5.** $\vec{A} = (4, 2)$

$\vec{B} = (2, 4)$

$\Rightarrow$ **sin(2α) = ?**




A) $\frac{6}{25}$ B) $\frac{7}{25}$ C) $\frac{12}{25}$ D) $\frac{16}{25}$ E) $\frac{24}{25}$

**6.** $\vec{A} = (1, 2 - m)$,

$\vec{B} = (2, 4)$,

$\vec{A} \perp \vec{B}$

$\Rightarrow$ **m = ?**

A) 3 B) 5 C) $\frac{5}{2}$ D) $\frac{3}{2}$ E) 1

**7.** $\vec{A} = [2, -3]$,

$\vec{B} = [-1, 5]$,

$\vec{C} = [7, -21]$,

$\vec{C} = \alpha \cdot \vec{A} + \beta \cdot \vec{B}$

$\Rightarrow \alpha \cdot \beta$ **= ?**

A) –6 B) –4 C) –3 D) –2 E) –1

**8.** $\vec{A} = [\sin 15, x]$,

$\vec{B} = [4 \cdot \sin 75, x + 2]$,

$\vec{A} \perp \vec{B} \Rightarrow$ **x = ?**

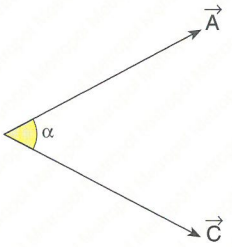
A) 3 B) 2 C) 1 D) –1 E) –2

**9.** $4 \cdot |\vec{A}| = 3 \cdot |\vec{C}|$

$\vec{B} \perp \vec{C}$,

$5\vec{A} - 3\vec{C} = 4\vec{B}$

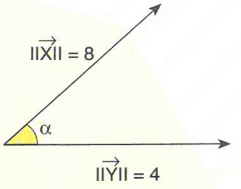
$\Rightarrow$ **cos$\alpha$ = ?**




A) $-\frac{1}{5}$ B) $-\frac{3}{5}$ C) $\frac{2}{5}$ D) $\frac{3}{5}$ E) $\frac{4}{5}$

**10.** $\theta = 60°$

$\Rightarrow$ **$\vec{X} \cdot \vec{Y}$ = ?**




A) 8 B) 12 C) 14 D) 16 E) 18

**11.** $\vec{A} = (-2, 4)$

$\vec{B} = (3, 7)$

$\vec{C} = (-1, 0)$

$\vec{D} = (a, b)$,

$\overrightarrow{AB} = \overrightarrow{CD}$

$\Rightarrow$ **$\|\vec{D}\|$ = ? br(u)**

A) 5 B) 4 C) 3 D) 2 E) 1

**12.** $\vec{A} = (\tan^2 x, -2)$

$\vec{B} = (\cot^2 x, \log_3 x$

A) 1 B) $\frac{1}{2}$ C) $\frac{\sqrt{3}}{2}$ D) $\frac{\sqrt{2}}{2}$ E) $\sqrt{2}$



**13.** $\vec{A} = [2a+3, 4, b+2]$

$\vec{B} = [2, 6, -3]$

$\vec{A} \,//\, \vec{B} \Rightarrow$ **a·b = ?**

A) 3 B) $\frac{10}{3}$ C) $\frac{13}{5}$ D) $-\frac{9}{5}$ E) $-6$

**14.** $\vec{A} = (3, 4)$,

$\vec{B} = (-6, 7)$

$\Rightarrow$ **$\vec{A} \cdot \vec{B}$ = ?**

A) –24 B) –12 C) –6 D) 8 E) 10

**15.** $\vec{U} \perp \vec{V}$,

$\vec{U} = (a + 1, -2)$,

$\vec{V} = (-2, 6) \Rightarrow$ **a = ?**

A) –2 B) –4 C) –5 D) –7 E) –8

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| B | C | E | C | E | C | A | D | E |
| **10** | **11** | **12** | **13** | **14** | **15** | | | |
| D | A | D | B | E | D | | | |

1. $<\vec{A}, \vec{B}> = \frac{\sqrt{2}}{2} \Rightarrow \cos x \cdot \sin x + \sin x \cdot \cos x = \frac{\sqrt{2}}{2}$

$2\sin x \cdot \cos x = \frac{\sqrt{2}}{2} \Rightarrow \sin 2x = \frac{\sqrt{2}}{2}$

$\Rightarrow 2x = 45° \Rightarrow x = 22,5°$

Yanıt / Answer B

2. $\vec{A} \cdot \vec{B} = (x + y)^2 - 4xy = 64$

$(x - y)^2 = 64$

$|x - y|^2 = 8^2$

$|x - y| = 8$

Yanıt / Answer C

3. $\vec{A} // \vec{B} \Rightarrow \frac{2x+y}{x} = \frac{2y+x}{y} = \frac{k}{4}$

$\Rightarrow \frac{2x+y+2y+x}{x+y} = \frac{k}{4} \Rightarrow k = 12$

Yanıt / Answer E

4. $-/\ \vec{A} - 2\vec{B} = (5, -8)$

$\vec{A} + \vec{B} = (14, 4)$

$3 \cdot \vec{B} = (9, 12)$

$\vec{B} = (3, 4) \Rightarrow |\vec{B}| = 5$

Yanıt / Answer C

5. $\vec{A} = (4, 2) \Rightarrow |\vec{A}| = \sqrt{20}$

$\vec{B} = (2, 4) \Rightarrow |\vec{B}| = \sqrt{20}$

$\vec{A} \cdot \vec{B} = 16$

$\cos\alpha = \frac{\vec{A} \cdot \vec{B}}{|\vec{A}| \cdot |\vec{B}|} = \frac{16}{20} = \frac{4}{5} \Rightarrow \sin\alpha = \frac{3}{5}$

$\sin 2\alpha = 2\sin\alpha \cdot \cos\alpha = \frac{24}{25}$

Yanıt / Answer E

6. $\vec{A} \perp \vec{B} \Rightarrow \vec{A} \cdot \vec{B} = 0$

$2 + 4 \cdot (2 - m) = 0 \Rightarrow m = \frac{5}{2}$

Yanıt / Answer C

7. $C = \alpha \cdot \vec{A} + \beta \cdot \vec{B} = [7, -21] = [2\alpha, -3\alpha] + [-\beta, 5\beta]$

$[2\alpha - \beta, -3\alpha + 5\beta] = [7, -21]$

$\left.\begin{array}{l} 2\alpha - \beta = 7 \\ -3\alpha + 5\beta = -21 \end{array}\right\} \Rightarrow \alpha = 2,\ \beta = -3$

$\alpha \cdot \beta = 2 \cdot (-3) = -6$

Yanıt / Answer A

8. $\vec{A} \perp \vec{B} \Rightarrow \vec{A} \cdot \vec{B} = 0$

$4\sin 15° \cdot \sin 75° + x \cdot (x+2) = 0$

$4\sin 15° \cdot \cos 15° + x^2 + 2x = 0$

$2\sin 30° + x^2 + 2x = 0$

$\Rightarrow x^2 + 2x + 1 = 0 \Rightarrow (x+1)^2 = 0 \Rightarrow x + 1 = 0$

$\Rightarrow x = -1$

Yanıt / Answer D

**9.** $\vec{A}\cdot\vec{C} = |\vec{A}|\cdot|\vec{C}|\cdot\cos\alpha$

$\vec{B}\perp\vec{C} \Rightarrow \vec{B}\cdot\vec{C} = 0$

$5\vec{A} - 3\vec{C} = 4\vec{B} \Rightarrow 5\vec{A}\cdot\vec{C} - 3\,\vec{C}\cdot\vec{C} = 4\cdot\vec{B}\cdot\vec{C}$

$5\cdot|\vec{A}|\cdot|\vec{C}|\cdot\cos\alpha - 3|\vec{C}|^2 = 0$

$\Rightarrow |\vec{C}|^2\cdot\left(\frac{15}{4}\cdot\cos\alpha - 3\right) = 0 \Rightarrow \cos\alpha = \frac{4}{5}$

**Yanıt / Answer E**

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**10.** $\vec{X}\cdot\vec{Y} = |\vec{X}|\cdot|\vec{Y}|.\cos\alpha$

$= 8\cdot 4\cdot\cos 60° = 16$

**Yanıt / Answer D**

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**11.** $\overrightarrow{AB} = (5, 3)$

$\overrightarrow{CD} = (a+1, b)$

$\overrightarrow{AB} = \overrightarrow{CD} \Rightarrow$

$a + 1 = 5 \Rightarrow a = 4$

$b = 3$

$\vec{D} = (4, 3) \Rightarrow \|\vec{D}\| = 5$ br(u)

**Yanıt / Answer A**

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**12.** $\vec{X}\cdot\vec{Y} = \sin 40°\cdot\cos 5° + \sin 5°\cdot\cos 40°$

$= \sin(40° + 5°) = \frac{\sqrt{2}}{2}$

**Yanıt / Answer D**

**13.** $\vec{A} \,//\, \vec{B} \Rightarrow \frac{2a+3}{2} = \frac{4}{6} = \frac{b+2}{-3}$

$\Rightarrow b = -4,\ a = -\frac{5}{6} \Rightarrow a\cdot b = \frac{10}{3}$

**Yanıt / Answer B**

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**14.** $\vec{A} = (3, 4)$,

$\vec{B} = (-6, 7)$

$\vec{A}\cdot\vec{B} = 3\cdot(-6) + 4\cdot 7 = -18 + 28 = 10$

**Yanıt / Answer E**

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**15.** $\vec{U}\perp\vec{V} \Rightarrow \vec{U}\cdot\vec{V} = 0$

$\vec{U}\cdot\vec{V} = 0 \Rightarrow -2(a + 1) - 12 = 0$

$\Rightarrow a = -7$

**Yanıt / Answer D**

**1.** $\vec{A} = (a, 5)$,
$\vec{B} = (7, b + 1)$,
$\vec{A} = \vec{B} \Rightarrow$ **a·b = ?**

A) 14 B) 16 C) 20 D) 24 E) 28

**2.** $\vec{A} = (-3, 4)$,
$\vec{B} = (2, -5)$
$2\vec{A} + 3\vec{B} = (x, y) \Rightarrow$ **x + y = ?**

A) –7 B) –5 C) –1 D) 5 E) 7

**3.** $\vec{A} = (-4, 1)$,
$\vec{B} = (-1, -3)$
$\Rightarrow$ $\overrightarrow{AB} = (?, ?)$

A) (–3, 4) B) (–1, 3) C) (3, –4) D) (3, –3) E) (3, –1)

**4.** $\vec{A} = (a + 1, b - 3)$,
$\vec{B} = (a - 2, b + 1)$,
$\Rightarrow |\overrightarrow{AB}| = ?$

A) $2\sqrt{3}$ B) $3\sqrt{2}$ C) 5 D) 6 E) $3\sqrt{3}$

**5.** $\vec{A} + \vec{B} = (4, -5)$
$\vec{A} - \vec{B} = (2, -3)$
$\Rightarrow |\vec{B}| = ?$

A) $\sqrt{2}$ B) $\sqrt{3}$ C) 2 D) $\sqrt{5}$ E) $\sqrt{6}$

**6.** $\vec{A} = (2, -3)$, $\vec{B} = (-1, 1)$,
$\Rightarrow |-2\vec{A} + 2\vec{B}| = ?$

A) 5 B) 8 C) 10 D) $2\sqrt{3}$ E) $3\sqrt{2}$

**7.** $\vec{A} = (1, 2)$, $\vec{B} = (-3, 1)$
$\vec{C} = (x, 3)$, $\vec{D} = (2, 2)$
$\overrightarrow{AC} \,//\, \overrightarrow{BD} \Rightarrow$ **x = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

**8.** $\vec{A} = (-1, 4)$
$\vec{B} = (1, -1)$
$\Rightarrow \overrightarrow{AB} = x \cdot \vec{e}_1 + y \cdot \vec{e}_2 = ?$

A) $2\vec{e}_1 - 5\vec{e}_2$ B) $3\vec{e}_1 - 4\vec{e}_2$ C) $4\vec{e}_1 - 3\vec{e}_2$ D) $\vec{e}_1 - 2\vec{e}_2$ E) $3\vec{e}_1 - \vec{e}_2$

**9.** $\vec{A} = (-2, 3)$, $\vec{B} = (3, x)$,
$\vec{C} = (-3, 1)$, $\vec{D} = (y, 5)$
$\overrightarrow{AB} = \overrightarrow{CD} \Rightarrow$ **x + y = ?**

A) 4 B) 5 C) 6 D) 7 E) 9

**10.** $\vec{A} = (-4, 2)$, $\vec{B} = (-2, 2)$, $\vec{C} = (x, y)$,
$4\vec{A} - 3\vec{B} = 2\vec{C} \Rightarrow$ **x·y = ?**

A) –7 B) –5 C) –3 D) 3 E) 5

**11.** $\vec{A} = (2, -3)$, $\vec{B} = (1, 2)$, $\vec{C} = (0, -2)$,
$x\cdot\vec{A} + y\cdot\vec{B} = \vec{C} \Rightarrow$ **x + y = ?**

A) $-\frac{4}{7}$ B) $-\frac{3}{7}$ C) $-\frac{2}{7}$ D) $\frac{2}{7}$ E) $\frac{3}{7}$

**12.** $\vec{A} = (x - 3)\vec{e_1} + 6\vec{e_2}$,
B(1, –2), C(–1, 1)
$\vec{A} \,//\, \overrightarrow{BC} \Rightarrow$ **x = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

**13.** $\overrightarrow{AB} = (-5, 3)$,
$\overrightarrow{CB} = (1, -2)$
$\overrightarrow{AC} = (x, y)$
$\Rightarrow$ **x·y = ?**

A) –30 B) –20 C) –10 D) –4 E) –2

**14.** $\vec{A} = (-5, 3)$, $\vec{B} = (0, y)$, $\vec{C} = (2, 1)$,
$\vec{D} = (3, y - 1)$,
$\overrightarrow{AB} \,//\, \overrightarrow{CD} \Rightarrow$ **y = ?**

A) $\frac{3}{4}$ B) 1 C) $\frac{5}{4}$ D) $\frac{3}{2}$ E) $\frac{7}{4}$

**15.** $\vec{A} - 2\vec{B} = (4, -6)$,
$\vec{A} + \vec{B} = (-2, 4)$
$\Rightarrow$ **$|\vec{A}|$ = ?**

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{2}{3}$ D) $\frac{3}{4}$ E) $\frac{3}{2}$

**16.** $\vec{A} = (2, -1)$, $\vec{B} = (-3, 4)$, $\vec{C} = (-13, 14)$,
$\vec{C} = x\cdot\vec{A} + y\cdot\vec{B} \Rightarrow$ **x + y = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| E | A | C | C | A | C | E | A | E |
| **10** | **11** | **12** | **13** | **14** | **15** | **16** | | |
| B | C | B | A | E | C | D | | |

**1.** $\vec{A} = 2\vec{e}_1 - 4\vec{e}_2$,
$\vec{B} = \vec{e}_1 + 5\vec{e}_2$,
$\overrightarrow{AB} = (x, y) \Rightarrow$ **$2x - y = ?$**

A) –11 B) –9 C) –7 D) 9 E) 11

**2.** $\vec{A} = (8, -2)$,
$\vec{B} = (-3, 1)$
$\frac{3}{2} \cdot \vec{A} - \vec{B} = (x, y) \Rightarrow$ **$x + y = ?$**

A) –11 B) –8 C) 0 D) 8 E) 11

**3.** $\vec{A} = (-1, 5)$,
$\vec{B} = (5, -3)$
$\Rightarrow$ **$|\overrightarrow{AB}| = ?$**

A) 5 B) 8 C) 10 D) 15 E) 17

**4.** $\vec{A} = (7, 3 - y)$,
$\vec{B} = (x - 1, 5)$,
$\vec{A} = \vec{B} \Rightarrow$ **$x \cdot y = ?$**

A) –20 B) –16 C) 4 D) 16 E) 20

**5.** $\vec{A} = (x - 2, 1)$
$\vec{B} = (6, 3)$
$\vec{A} \,//\, \vec{B} \Rightarrow$ **$x = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

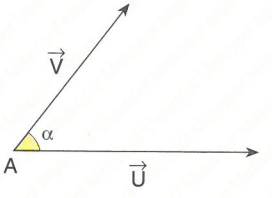
**6.** $\vec{A} = (-3, 5)$,
$\vec{B} = (2, -1)$,
$\Rightarrow$ **$\vec{A} \cdot \vec{B} = ?$**

A) –11 B) –9 C) –7 D) 7 E) 11

**7.** $\vec{A} = (1, -2)$, $\vec{B} = (-4, 3)$
$\Rightarrow$ **$< 2\vec{A}, -3\vec{B} > = ?$**

A) 30 B) 35 C) 40 D) 56 E) 60

**8.**




$|\vec{U}| = 2$, $\vec{V} = (-3, 4)$
$< 4\vec{U}, -2\vec{V} > = -40 \Rightarrow \alpha = ?$

A) 30° B) 36° C) 45° D) 60° E) 90°

**9.** $\vec{A} - 2\vec{B} = 0$,
$|\vec{A}| = 2\sqrt{3}$
$\vec{A} \,//\, \vec{B} \Rightarrow$ **A·B = ?**

A) 6 B) 8 C) 10 D) 12 E) 16

**10.** $\vec{A} = (\cot\alpha, \log_2 x)$
$\vec{B} = (\tan\alpha, 2)$
$\vec{A} \cdot \vec{B} = 7 \Rightarrow$ **x = ?**

A) 2 B) 4 C) 6 D) 8 E) 16

**11.** $\vec{A} = \vec{e}_1 - 2\vec{e}_2$,
$\vec{B} = 2\vec{e}_1 + 3\vec{e}_2$,
$\Rightarrow \vec{A}^2 \cdot \vec{B}^2 = ?$

A) 36 B) 42 C) 45 D) 56 E) 65

**12.** $\vec{A} = (\sin^2\alpha, -2)$,
$\vec{B} = (\cos^2\alpha, \log_3 x)$,
$\vec{A} \cdot \vec{B} = 5 \Rightarrow$ **x = ?**

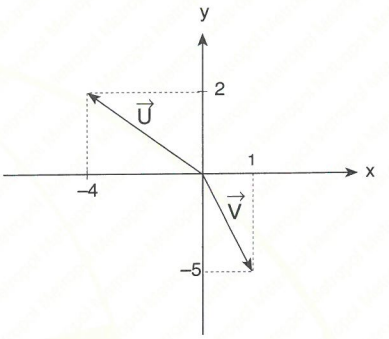
A) $\frac{1}{27}$ B) $\frac{1}{9}$ C) $\frac{1}{3}$ D) 3 E) 9



**13.** $\vec{A} = (x, -3)$
$\vec{B} = (6, 4)$
$\vec{A} \perp \vec{B} \Rightarrow$ **x = ?**

A) –4 B) –2 C) 0 D) 2 E) 4

**14.**



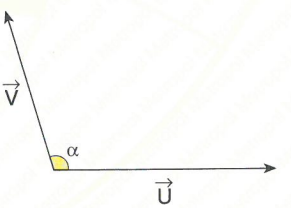

$\Rightarrow \vec{U} + \vec{V} = ?$

A) (–4, –3) B) (–3, –3) C) (–3, –2) D) (–4, 1) E) (–3, 1)

**15.** $\vec{A} = -2\vec{e}_1 + 3\vec{e}_2$,
$\vec{B} = \vec{e}_1 - 2\vec{e}_2$,
$\Rightarrow (\vec{A} \cdot \vec{B})^2 = ?$

A) 9 B) 16 C) 25 D) 49 E) 64

**16.**




$\vec{U} = (-2, 1)$, $\vec{V} = (3, 1) \Rightarrow \alpha = ?$

A) 90° B) 120° C) 135° D) 150° E) 180°

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| A | E | C | B | D | A | E | D | A |
| **10** | **11** | **12** | **13** | **14** | **15** | **16** | | |
| D | E | B | D | B | E | C | | |

# BÖLÜM CHAPTER 17

## TARİHSEL NOT / HISTORICAL NOTE

### Sir Andrew John Wiles [1953 – ]

İngiliz matematikçi ve Oxford Üniversitesi'nde Royal Society Research Profesörü, sayı teorisinde uzmanlaşmıştır. Fermat'ın son Teoremini kanıtlamakla ünlüdür. Royal Society tarafından 2017 Copley Madalyası ile ödüllendirildiği. 2000 yılında İngiliz İmparatorluğu Emri'nin Knight Komutanı olarak atandı. 2018'de Oxford'daki ilk Regius Matematik Profesörü olarak atandı.

He is a British mathematician and a Royal Society Research Professor at the University of Oxford, specializing in number theory. He is best known for proving Fermat's Last Theorem, for which he was awarded the 2017 Copley Medal by the Royal Society. He was appointed Knight Commander of the Order of the British Empire in 2000, and in 2018 was appointed as the first Regius Professor of Mathematics at Oxford.

# ÇÖZÜMLÜ DENEME SINAVLARI
# PRACTICE EXAMS WITH SOLUTIONS

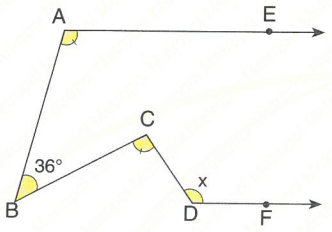
**Bu bölüm 50 çözümlü test sorusu içermektedir.**

**This chapter includes 50 test questions with solutions.**

**BÖLÜM / CHAPTER 15**

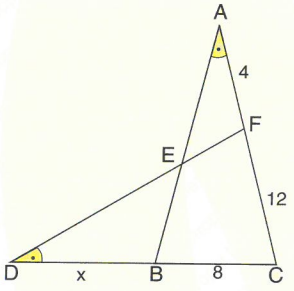
**ÇÖZÜMLÜ DENEME SINAVLARI/ PRACTICE EXAMS WITH SOLUTIONS**

**1.** [AE // [DF,
$m(\widehat{ABC}) = 36°$,
$m(\widehat{EAB}) = m(\widehat{BCD})$
$\Rightarrow$ **$m(\widehat{CDF}) = x = ?$**



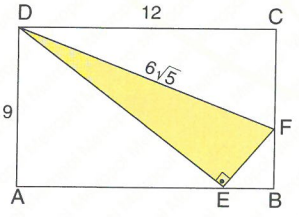

A) 132 B) 136 C) 138 D) 142 E) 144

**2.** $(\widehat{BAC}) = m(\widehat{CDF})$,
$|AF| = 4$ cm,
$|FC| = 12$ cm,
$|DB| = x$,
$|BC| = 8$ cm
$\Rightarrow$ **$x = ?$ cm**




A) 12 B) 14 C) 15 D) 16 E) 18

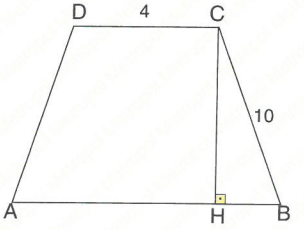
**3.**




ABCD bir dikdörtgendir. / ABCD is a rectangle.
$|EB| < |AE|$, $[DE] \perp [EF]$, $|AD| = 9$ cm, $|DC| = 12$ cm,
$|DF| = 6\sqrt{5}$ cm $\Rightarrow$ **$|EB| = ?$ cm**

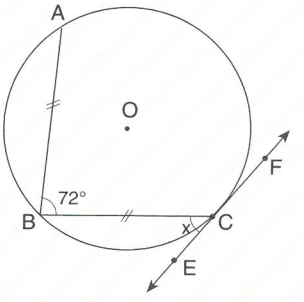
A) 3 B) 4 C) 5 D) 6 E) 7

**4.** ABCD bir yamuktur.
ABCD is a trapezoid.
$[AB] // [DC]$,
$|AD| = |BC| = |AH|$,
$|DC| = 4$ cm,
$|BC| = 10$ cm
$\Rightarrow$ **$A(ABCD) = ?$ cm$^2$**



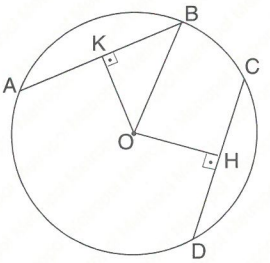

A) 40 B) $40\sqrt{3}$ C) 60 D) 80 E) $72\sqrt{2}$

**5.** $|AB| = |BC|$,
$m(\widehat{ABC}) = 72°$
$\Rightarrow$ **$m(\widehat{BCE}) = x = ?$**



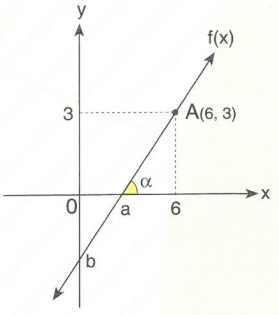

A) 54° B) 55° C) 56° D) 57° E) 58°

**6.** [OH] ⊥ [DC],
[OK] ⊥ [AB],
|AB| = |CD|,
|OH| = (3x + 1) cm,
|OK| = (5x – 9) cm
|OB| = 20 cm
⇒ **|DC| = ? cm**




A) 12 B) 18 C) 24 D) 28 E) 32

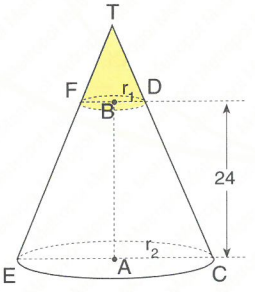
**7.**




tanα = 2 ⇒ **f(7) = ?**

A) 4 B) 5 C) $\frac{11}{2}$ D) 6 E) $\frac{13}{2}$

**8.** $|BD| = r_1 = 6$ cm,
$|AC| = r_2 = 18$ cm
⇒ **V(TFD) = ? cm³**




A) 204π B) 196π C) 192π D) 154π E) 144π

**9.** $\vec{A} = (8, a - 1)$
$\vec{B} = (6, a - 2)$
$\vec{A} \,//\, \vec{B}$ ⇒ **a = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

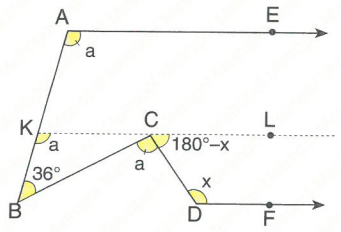
**10.** $\vec{A} = (2, 5, a)$
$\vec{B} = (-3, 4, 2)$
$\vec{A} \perp \vec{B}$ ⇒ **a = ?**

A) –4 B) –5 C) –6 D) –7 E) –8

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| E | D | A | D | A | C | B | E | A | D |

**1.**




[KL // [AE // [DF ⇒

$m(\widehat{BAE}) = m(\widehat{BCD}) = m(BKC) = a$

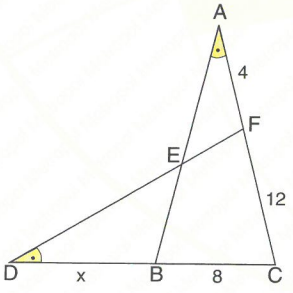
$m(\widehat{CDF}) = x \Rightarrow m(\widehat{LCD}) = 180° - x$

$36° + a = a + 180° - x$

$x = 180° - 36° = 144°$

**Yanıt / Answer E**

**2.**




$\widehat{ABC} \sim \widehat{DFC}$

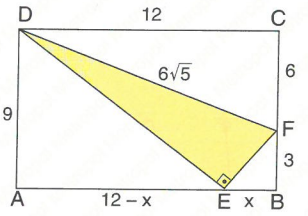
$\frac{|BC|}{|FC|} = \frac{|AC|}{|DC|} \Rightarrow \frac{8}{12} = \frac{16}{8+x}$

$8 + x = 24$

$x = 16$ cm

**Yanıt / Answer D**

**3.**




$|CF| = \sqrt{|DF|^2 - |DC|^2}$ [Pythagor]

$|CF| = \sqrt{(6\sqrt{5})^2 - 12^2} = 6$ cm

$|CF| = 6$ cm $\Rightarrow |FB| = 3$ cm

$\widehat{FEB} \sim \widehat{DAE}$

$\frac{|DA|}{|EB|} = \frac{|AE|}{|FB|} \Rightarrow \frac{9}{x} = \frac{12-x}{3}$

$27 = 12x - x^2$

$x^2 - 12x + 27 = 0$

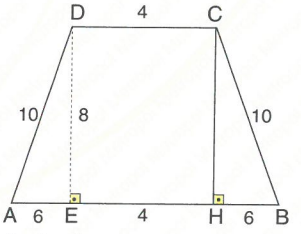
$(x-9).(x-3) = 0$

$x = 9 \vee x = 3$

$|EB| > |AE| \Rightarrow |EB| = 3$ cm

**Yanıt / Answer A**

**4.**




$\left.\begin{array}{l}[DE] \perp [AB] \\ |DA| = |CB|\end{array}\right\} \Rightarrow |AE| = |HB| = 6$ cm

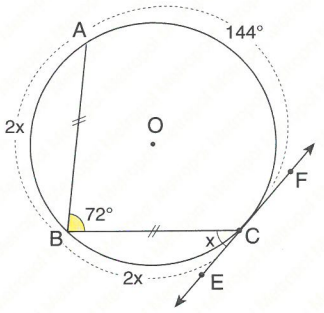
$|DE|^2 = |DA|^2 - |AE|^2$ [ *Pythagor* ]

$|DE|^2 = 10^2 - 6^2 \Rightarrow |DE| = 8$ cm

$A(ABCD) = \frac{8 \cdot (4+16)}{2} = 80$ cm$^2$

**Yanıt / Answer D**

**5.**




$m(\widehat{ABC}) = 72° \Rightarrow m(\widehat{AC}) = 144°$

$|AB| = |BC| \Rightarrow m(\widehat{BC}) = m(\widehat{AB}) = 2x$

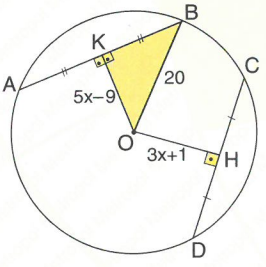
$144° + 2x + 2x = 360°$

$4x = 216°$

$x = 54°$

**Yanıt / Answer A**

**6.**




$|AB| = |CD| \Rightarrow |OK| = |OH|$

$5x - 9 = 3x + 1$

$2x = 10$

$x = 5$ cm

$x = 5 \Rightarrow |OK| = 5\cdot5 - 9 = 16$ cm

$|KB|^2 = |OB|^2 - |OK|^2$

$|KB|^2 = 20^2 - 16^2$

$|KB| = 12$ cm

$|CD| = |AB| = 2\cdot|KB| = 2\cdot12 = 24$ cm

**Yanıt / Answer C**

**7.** $(y - y_1) = m\cdot(x - x_1)$ , $m = \tan\alpha = 2$

$y - 3 = 2\cdot(x - 6) \Rightarrow y = f(x) = 2x - 9$

$f(7) = 2\cdot7 - 9$

$f(7) = 5$

**Yanıt / Answer B**

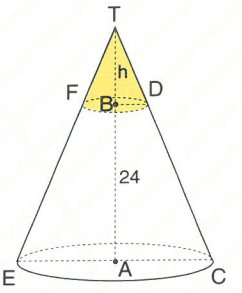
**8.** $\widehat{TBD} \sim \widehat{TAC} \Rightarrow$

$\frac{r_1}{r_2} = \frac{h}{h+24} = \frac{6}{18}$

$\Rightarrow h = 12$ cm

$V(TFD) = \frac{1}{3}\cdot\pi\cdot6^2\cdot12$

$= 144\pi$ cm$^2$




**Yanıt / Answer E**

**9.** $\vec{A} \,//\, \vec{B} \Rightarrow \frac{8}{6} = \frac{a-1}{a-2}$

$4a - 8 = 3a - 3$

$a = 5$

**Yanıt / Answer A**

**10.** $\vec{A} \perp \vec{B} \Rightarrow \vec{A}\cdot\vec{B} = 0$

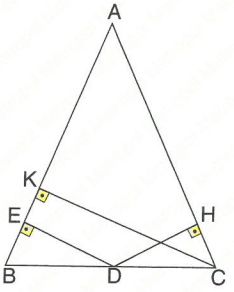
$\vec{A}\cdot\vec{B} = 2\cdot(-3) + 5\cdot4 + a\cdot2 = 0$

$14 + 2a = 0$

$a = -7$

**Yanıt / Answer D**

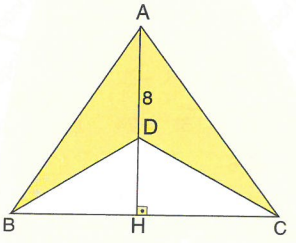
**1.** $|AB| = |AC|$,
$D \in [BC]$,
$[DH] \perp [AC]$,
$[DE] \perp [AB]$,
$[CK] \perp [AB]$,
$|BC| = 17$ cm,
$|DH| + |DE| = 15$ cm,
$|AK| = 20$ cm




**Çevre / The Perimeter (ABCD) = ? cm**

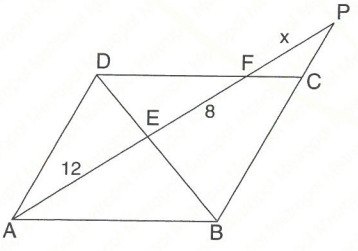
A) 57 B) 63 C) 67 D) 72 E) 77

**2.** $AH] \perp [BC]$,
$D \in [AH]$,
$|AD| = 8$ cm,
$|BC| = 18$ cm
$\Rightarrow$ **A(ABDC) = ? cm²**




A) 48 B) 54 C) 66 D) 72 E) 84

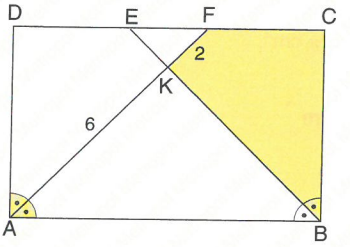
**3.**




ABCD bir paralelkenardır. / ABCD is a paralellogram.
$[AP] \cap [BD] = \{E\}$, $|AE| = 12$ cm, $|EF| = 8$ cm
$\Rightarrow$ **|FP| = x = ? cm**

A) 6 B) 8 C) 9 D) 10 E) 12

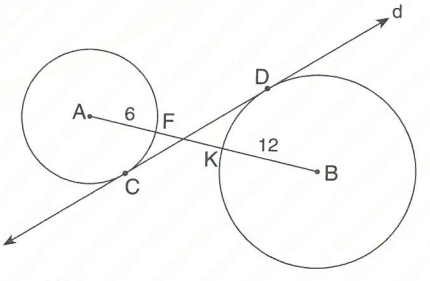
**4.**




ABCD bir dikdörtgendir. / ABCD is a rectangle.
$m(\widehat{DAF}) = m(\widehat{FAB})$, $m(\widehat{CBE}) = m(\widehat{EBA})$,
$[AF] \cap [BE] = \{K\}$, $|AK| = 6$ cm, $|KF| = 2$ cm
$\Rightarrow$ **A(BCFK) = ? cm²**

A) 12 B) 13 C) 14 D) 16 E) 18

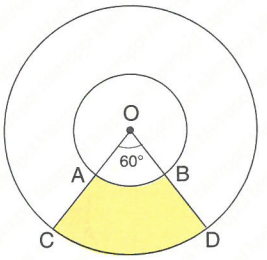
**5.**




$|AF| = 6$ cm, $|BK| = 12$ cm
$|AB| = 30$ cm $\Rightarrow$ **|DC| = ? cm**

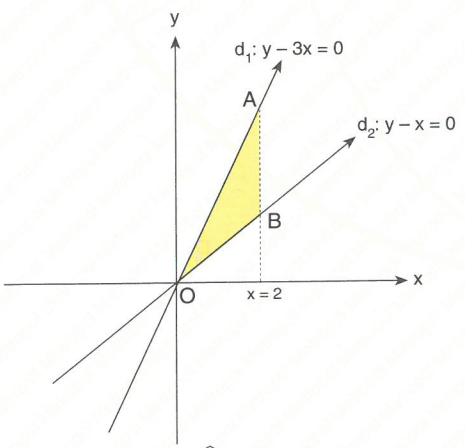
A) 16 B) 18 C) $8\sqrt{6}$ D) $12\sqrt{3}$ E) 24

**6.** $m(\widehat{COD}) = 60°$,
$TA / SA = 12\pi\ cm^2$,
$|AC| = 6$ cm
$\Rightarrow$ **$|AO| = ?$ cm**




A) 2 B) 3 C) 4 D) 5 E) 6

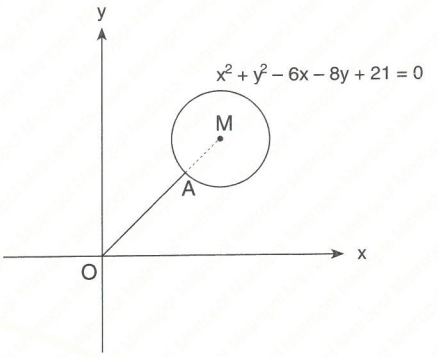
**7.**




$\Rightarrow$ **$A(\widehat{OAB}) = ?\ br^2(u^2)$**

A) 2 B) 3 C) $\frac{7}{2}$ D) 4 E) 6

**8.**




$\Rightarrow$ **$|OA| = x = ?\ br(u)$**

A) 3 B) 4 C) 5 D) 6 E) 7

**9.** $\left.\begin{array}{l}\vec{A} + \vec{B} = (6, -2) \\ |\vec{A}|^2 + |\vec{B}|^2 = 24\end{array}\right\} \Rightarrow \vec{A} \cdot \vec{B} = ?$

A) 6 B) $6\sqrt{2}$ C) 8 D) $8\sqrt{2}$ E) 10

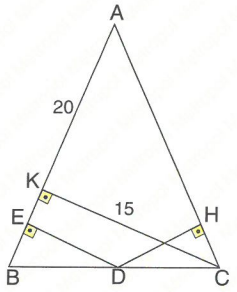
**10.** $\left.\begin{array}{l}\vec{A} = (\sin 20°, \sin 25°) \\ \vec{B} = (\cos 25°, \cos 20°)\end{array}\right\} \Rightarrow \vec{A} \cdot \vec{B} = ?$

A) $\frac{1}{2}$ B) $\frac{\sqrt{3}}{2}$ C) $\frac{\sqrt{2}}{2}$ D) $\frac{\sqrt{3}+\sqrt{2}}{2}$ E) 1

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| C | D | D | C | E | B | D | A | C | C |

**1.**




$|AB| = |AC| \Rightarrow |KC| = |DH| + |DE|$

$|KC| = 15$ cm

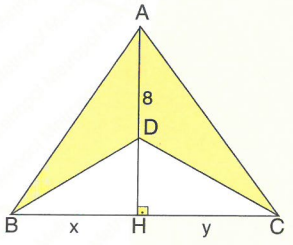
$|AC|^2 = 15^2 + 20^2$ [ Pythagor ]

$|AB| = |AC| = 25$ cm.

Çevre / Perimeter (ABCD) = 25 + 25 + 17 = 67 cm

**Yanıt / Answer C**

**2.**



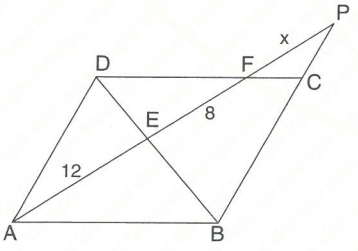

$$A(ABCD) = \frac{|AD| \cdot |BC|}{2}$$

$$= \frac{8 \cdot 18}{2}$$

$$= 72$$

**Yanıt / Answer D**

**3.**



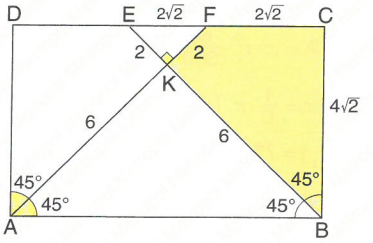

$|AE|^2 = |EF| \cdot |EP|$

$12^2 = 8 \cdot (8 + x)$

$144 = 64 + 8x \Rightarrow x = 10$ cm

**Yanıt / Answer D**

**4.**




$\perp \widehat{EKF}$ (45°, 45°, 90°) $\Rightarrow$

$|EK| = |KF| = 2$ cm $\Rightarrow |EF| = 2\sqrt{2}$ cm

$\perp \widehat{ECB}$ (45°, 45°, 90°) $\Rightarrow$

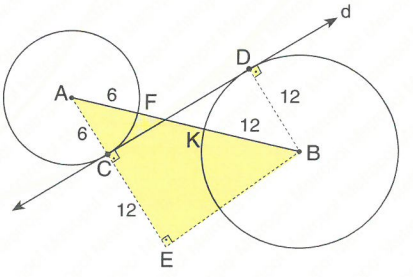
$|EB| = 8$ cm $\Rightarrow |EC| = |CB| = 4\sqrt{2}$ cm

$A(BCFK) = A(\widehat{BCE}) - A(\widehat{EKF})$

$$= \frac{4\sqrt{2} \cdot 4\sqrt{2}}{2} - \frac{2 \cdot 2}{2} = 14 \text{ cm}^2$$

**Yanıt / Answer C**

**5.**




$[DC] \,//\, [EB] \Rightarrow |DC| = |EB|$

$|AB|^2 = |AE|^2 + |EB|^2$

$30^2 = 18^2 + |EB|^2 \Rightarrow |EB| = 24$ cm

**Yanıt / Answer E**

**6.** $|OA| = r_1 \wedge |OC| = r_2 \Rightarrow |AC| = r_2 - r_1 = 6$ cm

$$TA/SA = \pi \cdot r_2^2 \cdot \frac{60°}{360°} - \pi \cdot r_1^2 \cdot \frac{60°}{360°}$$

$$12\pi = \frac{1}{6} \cdot \pi \cdot (r_2^2 - r_1^2) \Rightarrow r_2^2 - r_1^2 = 72$$

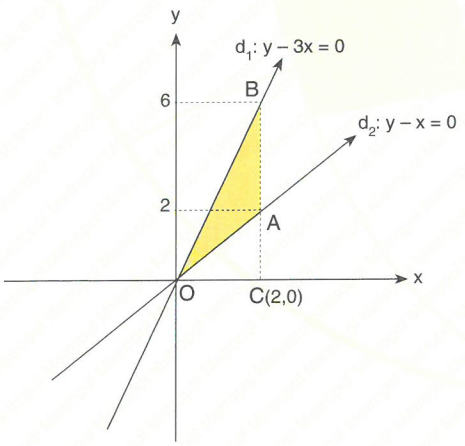
$$(r_1 - r_1) \cdot (r_2 + r_1) = 72$$

$$6 \cdot (r_2 + r_1) = 72 \Rightarrow r_2 + r_1 = 12$$

$$r_2 - r_1 = 12$$
$$-/\ r_2 - r_1 = 6$$
$$2r_1 = 6 \Rightarrow r_1 = |OA| = 3 \text{ cm}$$

**Yanıt / Answer B**

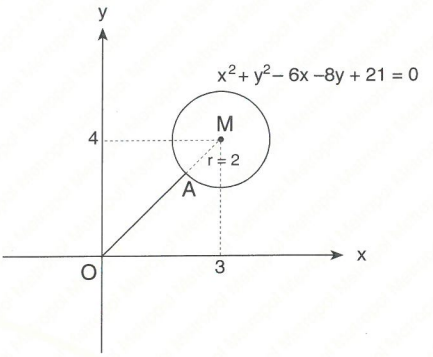
**7.**




$$A(\widehat{OBA}) = A(\widehat{OBC}) - A(\widehat{OAC})$$
$$= \frac{6 \cdot 2}{2} - \frac{2 \cdot 2}{2} = 4\,br^2(u^2)$$

**Yanıt / Answer D**

**8.**




$$x^2 + y^2 - 6x - 8y + 21 = 0$$
$$x^2 - 6x + 9 + y^2 - 8y + 16 = 4$$
$$(x - 3)^2 + (y - 4)^2 = 2^2$$
$$\Rightarrow M(3, 4),\ r = 2\ br(u)$$
$$|OM| = \sqrt{3^2 + 4^2} = 5\,br(u)$$
$$|OA| = |OM| - |MA|$$
$$= 5 - 2$$
$$= 3\,br(u)$$

**Yanıt / Answer A**

**9.** $|\vec{A} + \vec{B}|^2 = |\vec{A}|^2 + |\vec{B}|^2 + 2 \cdot \vec{A} \cdot \vec{B}$

$$6^2 + (-2)^2 = 24 + 2 \cdot \vec{A} \cdot \vec{B}$$
$$2 \cdot \vec{A} \cdot \vec{B} = 40 - 24$$
$$\vec{A} \cdot \vec{B} = 8$$

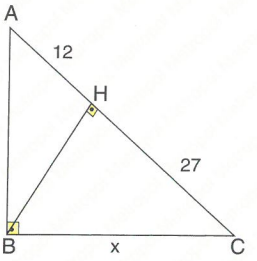
**Yanıt / Answer C**

**10.** $\vec{A} \cdot \vec{B} = (\sin 20° \cdot \sin 25° + \cos 25° \cdot \cos 20°)$

$$= \sin(20° + 25°) = \sin 45° = \frac{\sqrt{2}}{2}$$

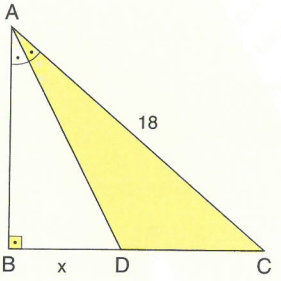
**Yanıt / Answer C**

**1.** [AB] ⊥ [BC],
[BH] ⊥ [AC],
|AH| = 12 cm,
|HC| = 27 cm
⇒ **|BC| = x = ? cm**



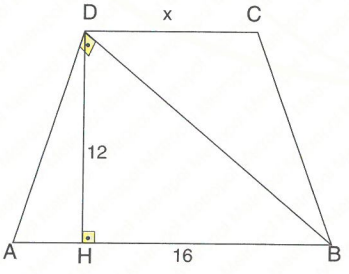

A) $9\sqrt{13}$ B) $9\sqrt{6}$ C) $12\sqrt{3}$ D) $13\sqrt{3}$ E) $9\sqrt{5}$

**2.** ABC bir dik üçgen,
[AD] bir açıortaydır.
ABC is a right triangle,
[AD] is a bisector.
|AC| = 18 cm
$A(\widehat{ADC}) = 54\ cm^2$
⇒ **|BD| = x = ? cm**



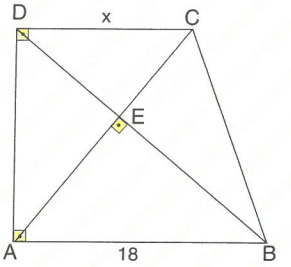

A) 3 B) 4 C) 6 D) $5\sqrt{3}$ E) $6\sqrt{3}$

**3.** ABCD bir ikizkenar yamuktur.
ABCD is an isosceles trapezoid.
|AD| = |BC|,
[AB] // [DC],
|DH| = 12 cm,
|HB| = 16 cm
⇒ **|DC| = x = ? cm**



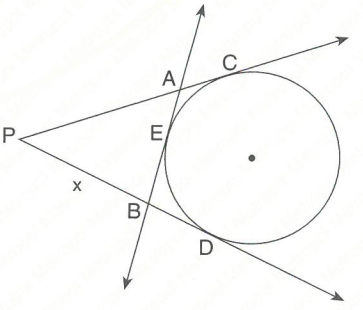

A) 6 B) 7 C) 8 D) 9 E) 12

**4.** ABCD bir dik yamuktur.
ABCD is a right trapezoid.
[AB] // [DC],
[DA] ⊥ [AB],
[AC] ⊥ [BD],
|AD| = $6\sqrt{6}$ cm,
|AB| = 18 cm
⇒ **|DC| = x = ? cm**




A) $9\sqrt{2}$ B) $6\sqrt{3}$ C) 12 D) 14 E) $4\sqrt{6}$

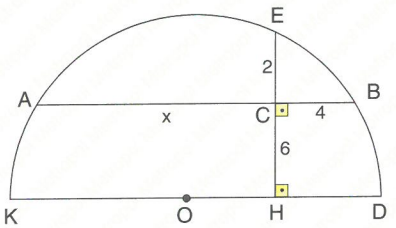
**5.**




|AC| = 2 cm, |BD| = 6 cm, |AP| = 8 cm ⇒ **|PB| = x = ? cm**

A) 4 B) 5 C) 6 D) 7 E) 8

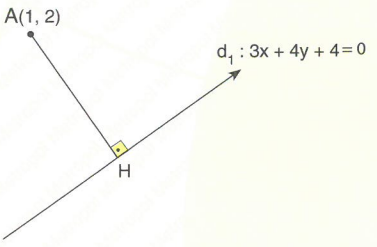
**6.**




[EH] ⊥ [AB], [EH] ⊥ [KD], |EC| = 2 cm, |CB| = 4 cm, |CH| = 6 cm ⇒ **|AC| = x = ? cm**

A) 3 B) 4 C) 5 D) 6 E) 7

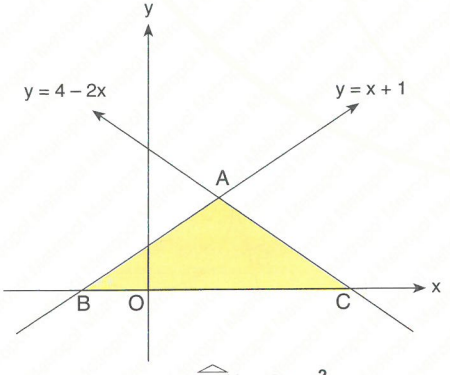
**7.**




[AH] ⊥ $d_1$ ⇒ **|AH| = ? br(u)**

A) 3 B) 4 C) 5 D) 6 E) 8

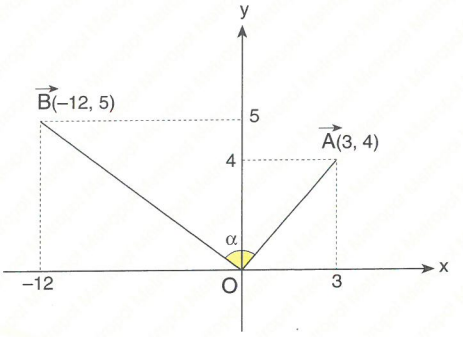
**8.**




⇒ **$A(\widehat{ABC})$ = ? cm²**

A) 3 B) $\frac{7}{2}$ C) 4 D) $\frac{9}{2}$ E) 5

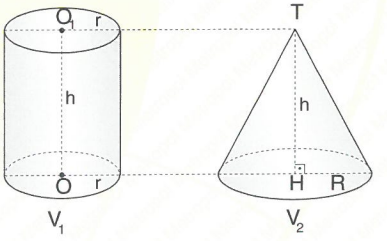
**9.**




$m(\widehat{BOA}) = a$ ⇒ **cos α = ?**

A) $\frac{17}{65}$ B) $\frac{38}{65}$ C) $\frac{16}{65}$ D) $-\frac{63}{65}$ E) $\frac{-16}{65}$

**10.**



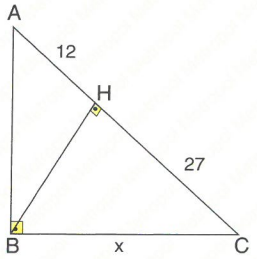

$V_1 = V_2$ ⇒ **$\frac{R}{r}$ = ?**

A) $\frac{3}{2}$ B) $\sqrt{3}$ C) 3 D) $\frac{\sqrt{3}}{2}$ E) $\frac{3}{4}$

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| A | C | B | C | A | E | A | A | E | B |

**1.**



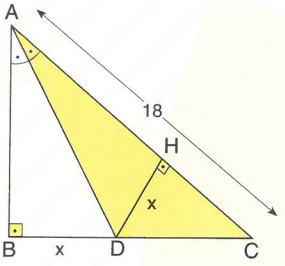

$|BC|^2 = |HC| \cdot |AC|$ [ Euclid ]

$|BC|^2 = 27 \cdot (27 + 12)$

$|BC| = 9\sqrt{13}$ cm

**Yanıt / Answer A**

**2.**



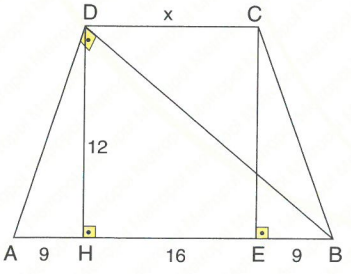

$m(\widehat{BAD}) = m(\widehat{DAC}) \Rightarrow |BD| = |DH| = x$

$A(\widehat{ADC}) = \dfrac{|DH| \cdot |AC|}{2} = 54$

$\dfrac{18 \cdot x}{2} = 54 \Rightarrow x = 6$ cm

**Yanıt / Answer C**

**3.**




$12^2 = |AH| \cdot 16$ [ Euclid ]

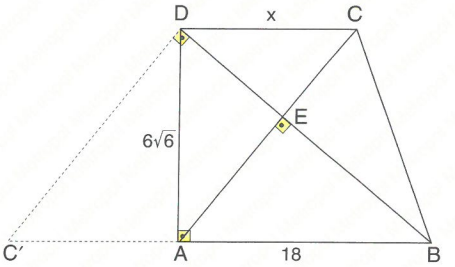
$|AH| = 9$ cm

$|AD| = |CB| \Rightarrow |AH| = |EB| = 9$ cm

$|DC| = |HE| = 16 - 9 = 7$ cm

**Yanıt / Answer B**

**4.**




$[DC] \,//\, [AC] \Rightarrow m(\widehat{C'DB}) = 90°$

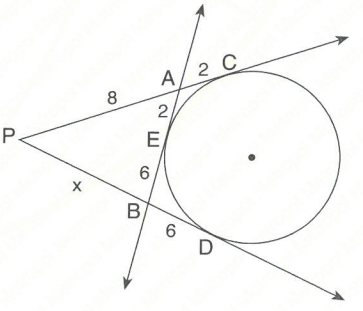
$|C'A| = |DC| = x$

$(6\sqrt{6})^2 = 18 \cdot x$ [ Euclid ]

$x = 12$ cm

**Yanıt / Answer C**

**5.**




$|AC| = |AE| = 2$ cm

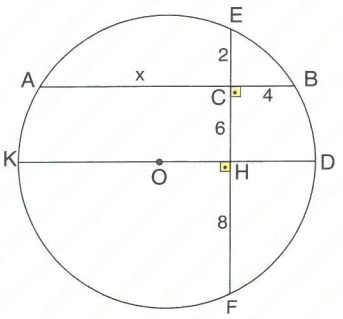
$|EB| = |BD| = 6$ cm

$|PC| = |PD| \Rightarrow 8 + 2 = x + 6$

$x = 4$ cm

**Yanıt / Answer A**

**6.**




$[OD] \perp [EF] \Rightarrow |EH| = |HF| = 8$ cm

$|AC| \cdot |CB| = |EC| \cdot |CF|$

$x \cdot 4 = 2 \cdot 14$

$x = 7$ cm

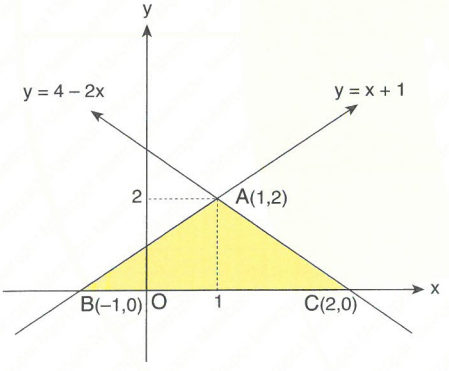
**Yanıt / Answer E**

**7.** $|AH| = \dfrac{3 \cdot 1 + 4 \cdot 2 + 4}{\sqrt{3^2 + 4^2}}$

$|AH| = \dfrac{15}{5} = 3\,br(u)$

**Yanıt / Answer A**

**8.**




$y = x + 1$

$y = 0 \Rightarrow x = -1 \Rightarrow B(-1, 0)$

$y = 4 - 2x$

$y = 0 \Rightarrow x = 2 \Rightarrow C(2, 0)$

$x + 1 = 4 - 2x \Rightarrow 3x = 3$

$x = 1$

$y = x + 1$

$x = 1 \Rightarrow y = 1 + 1 = 2 \Rightarrow A(1, 2)$

$A(\widehat{ABC}) = \dfrac{2 \cdot 3}{2} = 3\,br^2(u^2)$

**Yanıt / Answer A**

**9.** $|\vec{A}| = \sqrt{3^2 + 4^2} = \sqrt{25} = 5$

$|\vec{B}| = \sqrt{5^2 + 12^2} = \sqrt{169} = 13$

$\cos\alpha = \dfrac{\vec{A} \cdot \vec{B}}{|\vec{A}| \cdot |\vec{B}|} = \dfrac{3 \cdot (-12) + 5 \cdot 4}{5 \cdot 13}$

$= -\dfrac{16}{65}$

**Yanıt / Answer E**

**10.** $V_1 = V_2 \Rightarrow \pi \cdot r^2 . h = \dfrac{1}{3} \cdot \pi \cdot R^2 \cdot h$

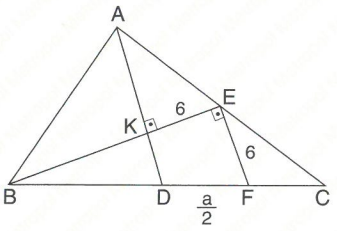
$R^2 = 3r^2$

$R = \sqrt{3} \cdot r$

$\Rightarrow \dfrac{R}{r} = \dfrac{\sqrt{3} \cdot r}{r} = \sqrt{3}$

**Yanıt / Answer B**

**1.**




K noktası şekildeki ABC üçgeninin ağırlık merkezidir.

K is center of the gravity ABC triangle in the figure.

[AD] ∩ [BE] = {K} , [AD] ⊥ [BE], [EF] // [AD],

|EF| = |KE| = 6 cm ⇒ **|BC| = ? cm**

A) $8\sqrt{10}$ B) $12\sqrt{5}$ C) $9\sqrt{6}$ D) 24 E) 32

**2.** ABC bir eşkenar üçgendir.

ABC is an equaliteral triangle.

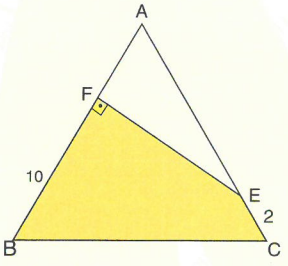
E ∈[AC],

[EF] ⊥ [AB],

|EC| = 2 cm,

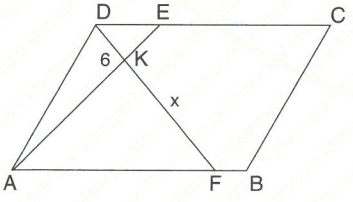
|FB| = 10 cm

⇒ **A(BFEC) = ? cm²**




A) $32\sqrt{3}$ B) $45\sqrt{3}$ C) $49\sqrt{3}$ D) $54\sqrt{3}$ E) $63\sqrt{3}$

**3.**




ABCD bir paralelkenardır. / ABCD is a parallelogram.

|EC| = 3|DE|, |AF| = 5·|FB|,

[AE] ∩ [DF] = {K}, |DK| = 6 cm

⇒ **|KF| = x = ? cm**

A) 18 B) 20 C) 24 D) 30 E) 32

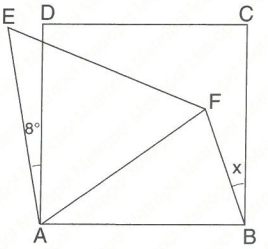
**4.** ABCD bir kare, AEF eşkenar üçgendir.

*ABCD is a square,*

AEF is an equaliteral triangle.

m(EAD) = 8°

⇒ **m(FBC) = x = ?**



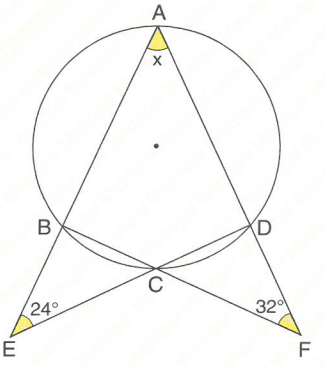

A) 14 B) 15 C) 16 D) 18 E) 19

**5.** [FB] ∩ [ED] = {C},

m(AED) = 24°,

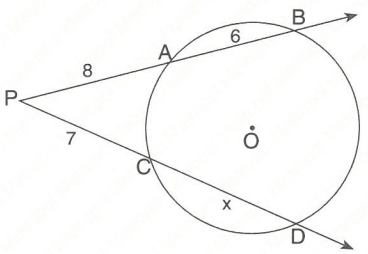
m(AFB) = 32°

⇒ **m(EAF) = x = ?**




A) 76° B) 72° C) 66° D) 64° E) 62°

**6.**

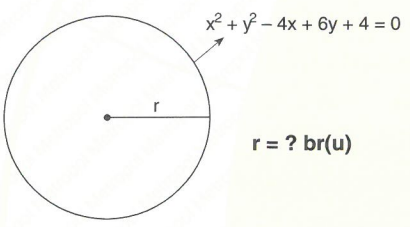



$|BA| = 8$ cm, $|AB| = 6$ cm, $|PC| = 7$ cm

$\Rightarrow$ **$|CD| = x = ?$ cm**

A) 7 B) 8 C) 9 D) 10 E) 11

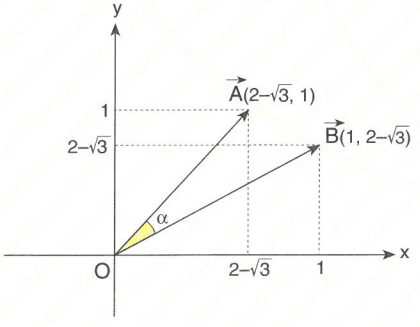
**7.**




**r = ? br(u)**

A) $\sqrt{13}$ B) $2\sqrt{3}$ C) 4 D) $3\sqrt{2}$ E) 3

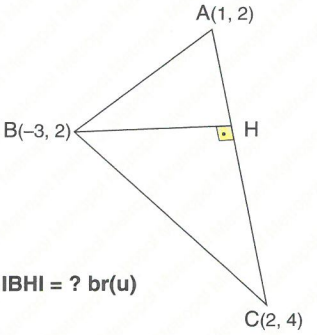
**8.**




$\Rightarrow$ **$\cos\alpha = ?$**

A) $\frac{\sqrt{3}}{2}$ B) $\frac{2}{3}$ C) $\frac{1}{2}$ D) $\frac{\sqrt{2}}{2}$ E) $\frac{3}{4}$

**9.**




**$|BH| = ?$ br(u)**

A) $\frac{4\sqrt{5}}{5}$ B) $\sqrt{5}$ C) $\frac{6\sqrt{5}}{5}$ D) $\frac{7\sqrt{5}}{5}$ E) $\frac{8\sqrt{5}}{5}$

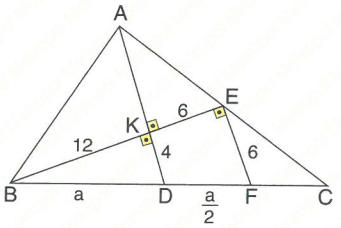
**10.** $\left.\begin{array}{l} |\vec{A} + \vec{B}| = 6\sqrt{2} \\ |\vec{A}| = 3 \\ |\vec{B}| = 5 \end{array}\right\} \Rightarrow \vec{A} \cdot \vec{B} = ?$

A) 17 B) 18 C) 19 D) 20 E) 21

**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| A | C | B | E | E | C | E | C | E | C |

**1.**




K noktası ağırlık merkezidir.

$|BK| = 2\cdot |KE|$

$|BK| = 2\cdot 6 = 12$ cm

$[EF] // [AD] \Rightarrow \widehat{BKD} \sim \widehat{BEF}$

$\frac{|BK|}{|BE|} = \frac{|KD|}{|EF|} \Rightarrow \frac{12}{18} = \frac{|KD|}{6}$

$|KD| = 4$ cm

$|BD|^2 = |BK|^2 + |KD|^2$

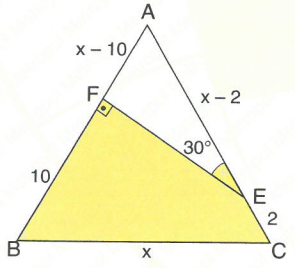
$|BD|^2 = 12^2 + 4^2$

$|BD| = 4\sqrt{10}$ cm

$|BC| = 2\cdot|BD| = 2\cdot 4\sqrt{10} = 8\sqrt{10}$ cm

**Yanıt / Answer A**

**2.**




$\widehat{AFE}$ (30°, 60°, 90°) $\Rightarrow$

$x - 2 = 2\cdot(x - 10)$

$x = 18$ cm

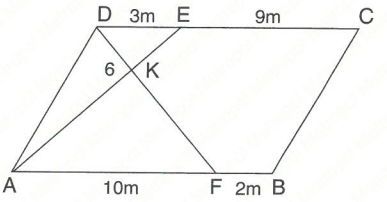
$A(\widehat{ABC}) = \frac{18^2\cdot\sqrt{3}}{4} = 81\sqrt{3}$ cm$^2$

$A(\widehat{AFE}) = \frac{8\cdot 8\sqrt{3}}{2} = 32\sqrt{3}$ cm$^2$

$A(BFEC) = 81\sqrt{3} - 32\sqrt{3} = 49\sqrt{3}$ cm$^2$

**Yanıt / Answer C**

**3.**




$|FB| = 2m \Rightarrow$

$|AF| = 10m$, $|DE| = 3m$, $|EC| = 9m$

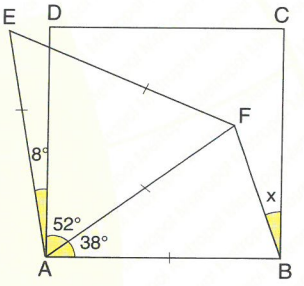
$\widehat{DKE} \sim \widehat{AKF}$

$\frac{|DE|}{|AF|} = \frac{|DK|}{|KF|} \Rightarrow \frac{3m}{10m} = \frac{6}{x}$

$x = 20$

**Yanıt / Answer B**

**4.**




$m(\widehat{DAF}) = 60° - 8° = 52°$

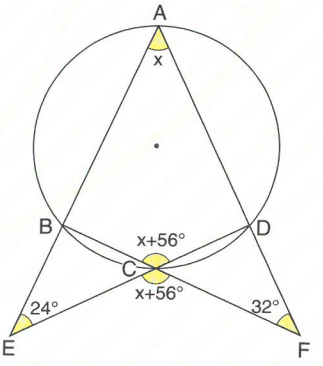
$m(\widehat{DAF}) = 52° \Rightarrow m(\widehat{FAB}) = 38°$

$|AF| = |AB| \Rightarrow m(\widehat{FAB}) = \frac{180° - 38°}{2} = 71°$

$x = 90° - 71° = 19°$

**Yanıt / Answer E**

**5.**



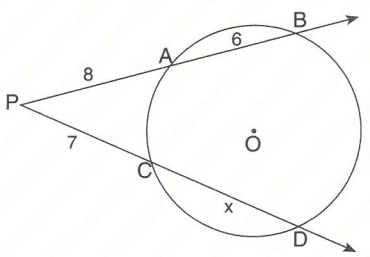

$m(\widehat{BCD}) = m(\widehat{ECF}) = x + 24° + 32° = x + 56°$

ABCD kirişler dörtgenidir. / The inscribed quadrilateral.

$x + x + 56° = 180° \Rightarrow x = 62°$

**Yanıt / Answer E**

**6.**



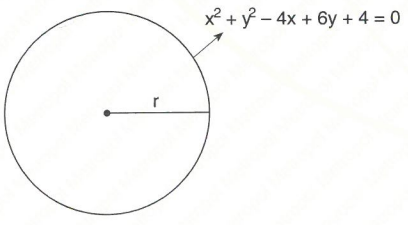

$|PA|\cdot|PB| = |PC|\cdot|PD|$

$8\cdot 14 = 7\cdot(7 + x)$

$x = 9$ cm

**Yanıt / Answer C**

**7.**



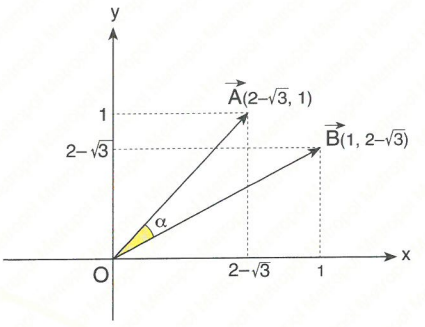

$x^2 + y^2 - 4x + 6y + 4 = 0$

$x^2 - 4x + 4 + y^2 + 6y + 9 = 9$

$(x - 2)^2 + (y + 3)^2 = 3^2 \Rightarrow r = 3$ br(u)

**Yanıt / Answer E**

**8.**




$$\cos\alpha = \frac{\vec{A}\cdot\vec{B}}{|\vec{A}|\cdot|\vec{B}|} = \frac{(2-\sqrt{3})\cdot 1 + 1\cdot(2-\sqrt{3})}{\left(\sqrt{(2-\sqrt{3})^2+1^2}\right)\cdot\left(\sqrt{(2-\sqrt{3})^2+1^2}\right)}$$

$$= \frac{4-2\sqrt{3}}{8-4\sqrt{3}} = \frac{1}{2}$$

**Yanıt / Answer C**

**9.**

$$A(\widehat{ABC}) = \begin{vmatrix} 1 & 2 \\ -3 & 2 \\ 2 & 4 \\ 1 & 2 \end{vmatrix} = \frac{1}{2}\cdot\left|(2-12+4)-(-6+4+4)\right|$$

$= 4\,br^2(u^2)$

$|AC| = \sqrt{(2-1)^2+(4-2)^2} = \sqrt{3}$

$A(\widehat{ABC}) = \dfrac{|AC|\cdot|BH|}{2} \Rightarrow 4 = \dfrac{\sqrt{5}\cdot|BH|}{2}$

$\Rightarrow |BH| = \dfrac{8\sqrt{5}}{5}\,br(u)$

**Yanıt / Answer E**

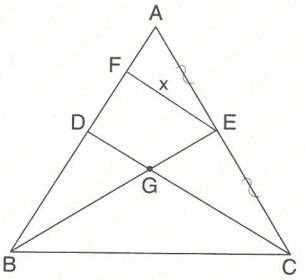
**10.** $|\vec{A}+\vec{B}| = |\vec{A}|^2 + |\vec{B}|^2 + 2\cdot\vec{A}\cdot\vec{B}$

$(6v2)^2 = 3^2 + 5^2 + 2\cdot\vec{A}\cdot\vec{B}$

$\Rightarrow \vec{A}\cdot\vec{B} = 19$

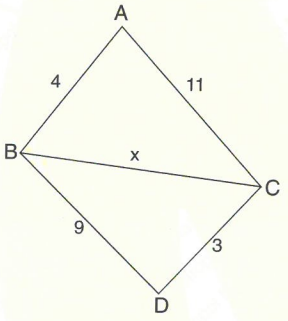
**Yanıt / Answer C**

**1.** ABC üçgeninin ağırlık merkezidir.
G is center of gravity in the ABC triangle.
[EF] // [CD],
|CD| = 18 cm
⇒ **|EF| = x = ? cm**



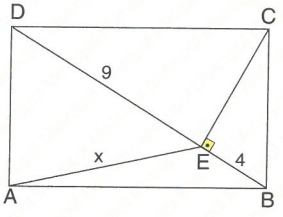

A) 6 B) 8 C) 9 D) 10 E) 12

**2.** |AB| = 4 cm,
|AC| = 11 cm,
|BD| = 9 cm,
|DC| = 3 cm,
|BC| = x cm
⇒ **max(x) = ?**




A) 14 B) 13 C) 11 D) 10 E) 9

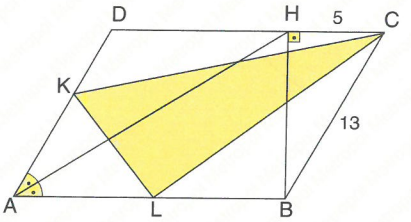
**3.**




ABCD bir dikdörtgendir. / ABCD is a rectangle.
[CE] ⊥ [DB], |DE| = 9 cm, |EB| = 4 cm ⇒ **|AE| = x = ?cm**

A) $\sqrt{57}$ B) $\sqrt{38}$ C) $2\sqrt{14}$ D) $3\sqrt{37}$ E) $\sqrt{61}$

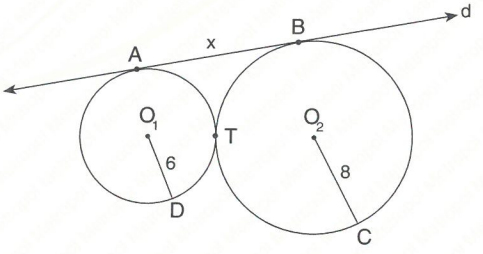
**4.**




ABCD bir paralelkenardır. / ABCD is a parallelogram.
[BH] ⊥ [DC], m($\widehat{DAH}$) = m($\widehat{HAB}$), |AL| = |LB|,
|AK| = |KD|, |HC| = 5 cm, |BC| = 13 cm ⇒ **A($\widehat{CKL}$) = ? cm²**

A) 81 B) 72 C) 64 D) 54 E) 48

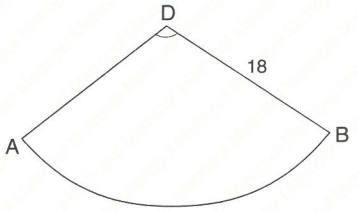
**5.**




$|O_1D| = 6$ cm, $|O_2C| = 8$ cm ⇒ **|AB| = x = ? cm**

A) 12 B) $8\sqrt{3}$ C) $12\sqrt{3}$ D) $6\sqrt{6}$ E) 15

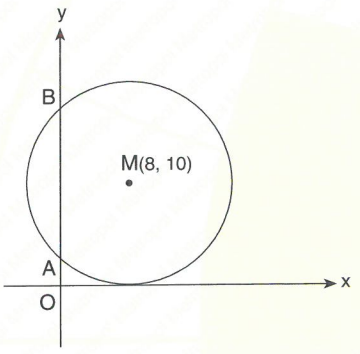
**6.**




$|\widehat{AB}| = 12\pi$ cm $\Rightarrow$ **$A(\widehat{DAB}) = = ?\ \pi$ cm$^2$**

A) 36 B) 54 C) 72 D) 96 E) 108

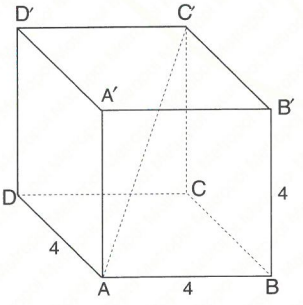
**7.**




$\Rightarrow$ **|AB| = ? br(u)**

A) 6 B) 8 C) 10 D) 12 E) 16

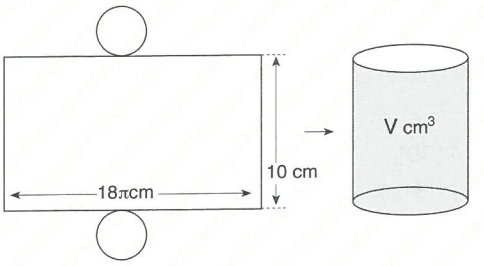
**8.**




|AB| = |BC| = |BB′| = 4 cm $\Rightarrow$ **|AC′| = ? cm**

A) $3\sqrt{3}$ B) $4\sqrt{2}$ C) $4\sqrt{3}$ D) $3\sqrt{2}$ E) $2\sqrt{6}$

**9.**




$\Rightarrow$ **V = ? cm$^3$**

A) 800 B) 810 C) 840 D) 920 E) 960

**10.** $\vec{A} = (2, 4)$

$\vec{B} = (6, a)$

$\vec{C} = (b, 4)$

$2\vec{A} - 4\vec{C} = 3\vec{B} \Rightarrow$ **a·b = ?**

A) 9 B) $\frac{27}{2}$ C) $\frac{28}{3}$ D) $\frac{29}{2}$ E) 10

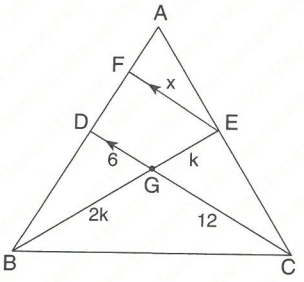
**YANITLAR / ANSWERS**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| C | C | E | A | B | E | D | C | B | C |

**1.** $|BG| = 2\cdot|GK|$

$[CD] \,//\, [EF]$,

$$\left.\begin{array}{l}\dfrac{x}{6} = \dfrac{3k}{2k} \\[2ex] \dfrac{x}{6} = \dfrac{3}{2}\end{array}\right\} \Rightarrow \begin{array}{l} 2x = 18 \\ x = 9 \text{ cm}\end{array}$$




Yanıt / Answer **C**

**2.** $\widehat{ABC} \Rightarrow$

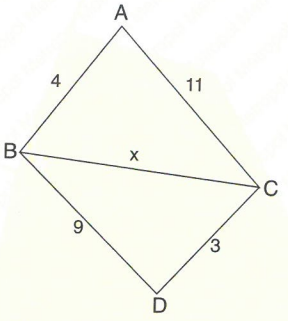
$|11 - 4| < x < 4 + 11$

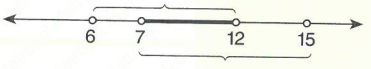
$\Rightarrow 7 < x < 15$

$\widehat{BDC} \Rightarrow$

$|9 - 3| < x < 9 + 3$

$\Rightarrow 6 < x < 12$

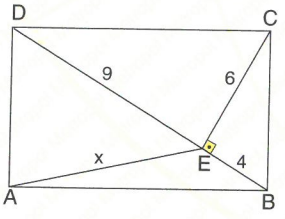



$7 < x < 12 \Rightarrow \max(x) = 11$

Yanıt / Answer **C**

**3.**




$|CE|^2 = |DE|\cdot|EB|$ [ *Euclid* ]

$|CE|^2 = 9\cdot 4$

$|CE| = 6$ cm

$|DE|^2 + |EB|^2 = |AE|^2 + |EC|^2$

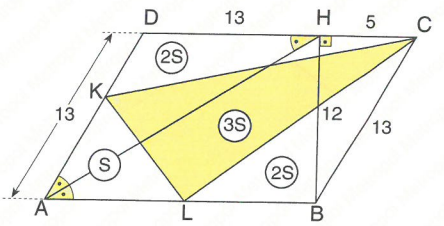
$9^2 + 4^2 = 6^2 + x^2$

$x^2 = 61$

$x = \sqrt{61}$ cm

Yanıt / Answer **E**

**4.**




$|HB|^2 = |BC|^2 - |HC|^2$ [ Pythagor ]

$= 13^2 - 5^2 \Rightarrow |HB| = 12$ cm

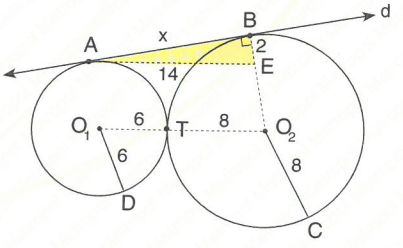
$m(\widehat{DAH}) = m(\widehat{DHA}) \Rightarrow |AD| = |DH| = 13$ cm

$A(ABCD) = 8\cdot S = 18\cdot 12 \Rightarrow S = 27$ cm

$A(\widehat{CKL}) = 3\cdot S = 3\cdot 27 = 81$ cm$^2$

Yanıt / Answer **A**

**5.**




$[AE] \,//\, [O_1O_2] \Rightarrow |AE| = 6 + 8 = 14$ cm

$|BE| = 8 - 6 = 2$ cm

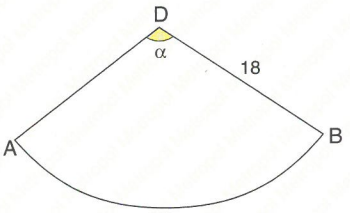
$|AB|^2 = |AE|^2 - |BE|^2$

$|AB|^2 = 14^2 - 2^2$

$|AB| = 8\sqrt{3}$ cm

Yanıt / Answer **B**

**6.**

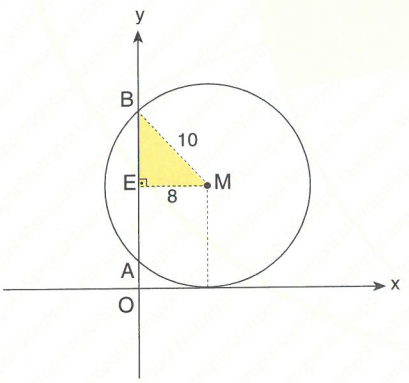



$2\pi \cdot 18\frac{\alpha}{360^o} = 12\pi \Rightarrow \alpha = 120^o$

$A(\overset{\triangledown}{DAB}) = \pi \cdot 18^2 \cdot \frac{120^o}{360^o} = 108\pi \text{ cm}^2$

**Yanıt / Answer E**

**7.**




$|BE| = \sqrt{|BM|^2 - |EM|^2}$

$|BE| = \sqrt{10^2 - 8^2}$

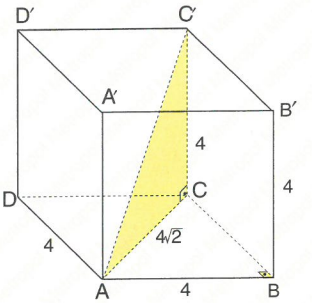
$|BE| = 6\,br(u)$

$|BA| = 2 \cdot |BE|$

$= 2 \cdot 6 = 12\,br(u)$

**Yanıt / Answer D**

**8.**

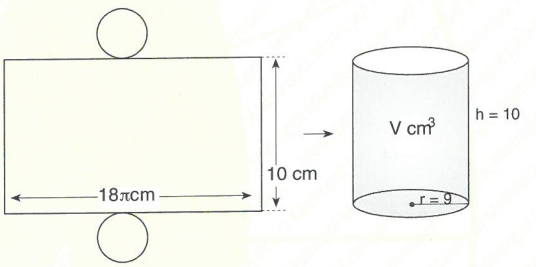



$|AC| = \sqrt{4^2 + 4^2} = 4\sqrt{2}$ cm

$|AC'| = \sqrt{(4\sqrt{2})^2 + 4^2} = 4\sqrt{3}$ cm

**Yanıt / Answer C**

**9.**




$2 \cdot \pi \cdot r = 18 \cdot \pi \Rightarrow r = 9$

$h = 10$ cm

$h = \pi \cdot 9^2 \cdot 10 = 810 \text{ cm}^3$

**Yanıt / Answer B**

**10.** $2 \cdot \vec{A} = (4, 8)$

$4 \cdot \vec{C} = (4b, 16)$

$3 \cdot \vec{B} = (18, 3a)$

$2\vec{A} - 4\vec{C} = 3\vec{B}$

$(4 - 4b, 8 - 16) = (18, 3a)$

$4 - 4b = 18 \quad \wedge \quad -8 = 3a$

$b = -\frac{7}{2} \wedge a = -\frac{8}{3}$

$\Rightarrow a \cdot b = -\frac{7}{2} \cdot -\frac{8}{3} = \frac{28}{3}$

**Yanıt / Answer C**