



AÇI

$$1. 2.m(\hat{A}) = 72^\circ 84' 68'' = 71^\circ 144' 68''$$

$$3.m(\hat{B}) = 63^\circ 99' 63'' = 63^\circ 99' 63''$$

$$\frac{2m(\hat{A}) - 3m(\hat{B})}{\quad} = 8^\circ 45' 05''$$

$$2. x + (6y - x) = 90$$

$$6y = 90$$

$$y = 15^\circ$$

$$y + (5y + 2x) = 180$$

$$6y + 2x = 180$$

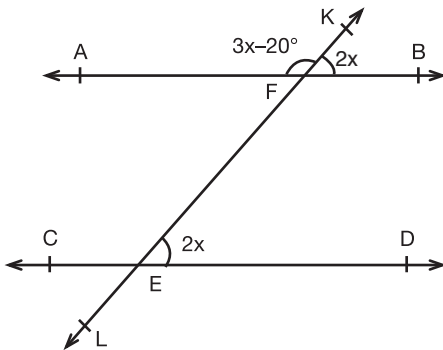
$$6 \cdot 15 + 2x = 180$$

$$2x = 90$$

$$x = 45^\circ$$

$$x + y = 45 + 15 = 60^\circ$$

3.



$$m(\hat{FED}) = m(\hat{KFB}) \text{ (Yöndeş açılar)}$$

$$m(\hat{KFA}) + m(\hat{KFB}) = 180^\circ \text{ (Bütünler açılar)}$$

$$3x - 20 + 2x = 180$$

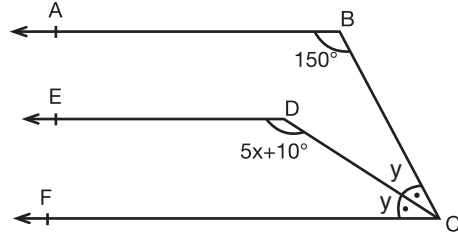
$$5x = 200$$

$$x = 40^\circ$$

$$m(\hat{KFB}) = 2x = 2 \cdot 40 = 80$$

Cevap: A

4.



$$m(\hat{ABC}) + m(\hat{BCF}) = 180 \text{ (Karşı durumlu açılar)}$$

$$150 + 2y = 180$$

$$y = 15$$

$$m(\hat{EDC}) + m(\hat{DCF}) = 180^\circ \text{ (Karşı durumlu açılar)}$$

$$5x + 10 + 15 = 180$$

$$5x = 155$$

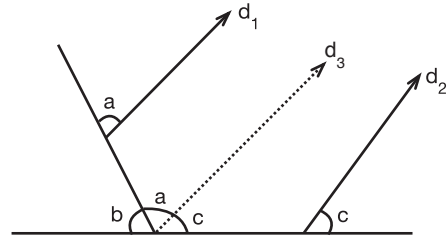
$$x = 31^\circ$$

Cevap: C

Cevap: C

TASARI & DEV KADRO

5.



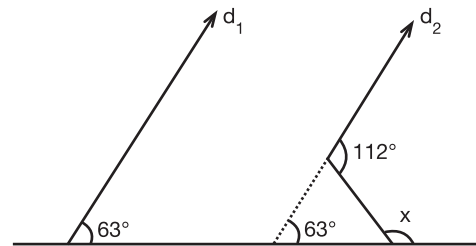
$$a + c = 150$$

$$a + b + c = 180^\circ$$

$$a + c = 150^\circ \Rightarrow b = 30^\circ$$

Cevap: C

6.



x = ?

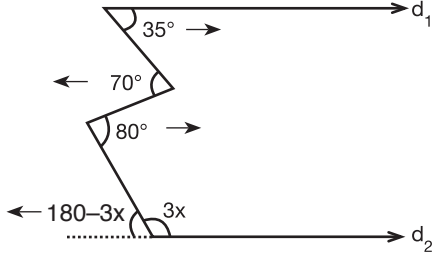
$$x = 68 + 63 = 131^\circ$$

Cevap: E

Cevap: D

AÇI

7.

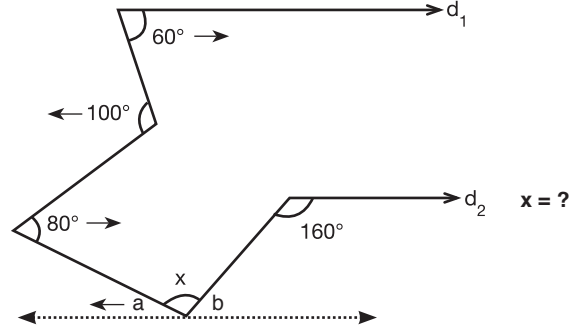


$$x = ?$$

$$\begin{aligned} 35 + 80 &= 70 + (180 - 3x) \\ 115 &= 250 - 3x \\ 3x &= 135 \\ x &= 45^\circ \end{aligned}$$

Cevap: D

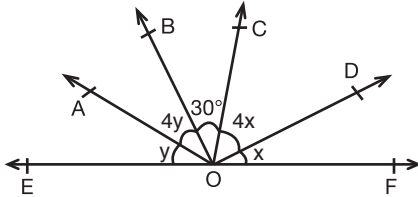
9.



$$\begin{aligned} 60 + 80 &= 100 + a & 160 + b &= 180^\circ \\ a &= 40^\circ & b &= 20^\circ \\ x + a + b &= 180 \\ x + 40 + 20 &= 180 & \Rightarrow & x = 120^\circ \end{aligned}$$

Cevap: B

8.



$$\begin{aligned} 4m(\widehat{FOD}) &= m(\widehat{COD}) \\ 4m(\widehat{EOA}) &= m(\widehat{AOB}) \end{aligned}$$

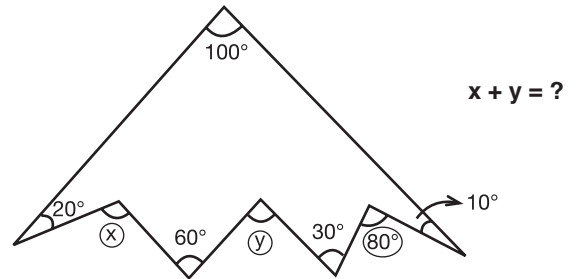
$$m(\widehat{AOD}) = ?$$

$$\begin{aligned} 5y + 30 + 5x &= 180 \\ 5(x + y) &= 150 \\ x + y &= 30 \end{aligned}$$

$$\begin{aligned} m(\widehat{AOD}) &= 4x + 4y + 30 \\ &= 4(x + y) + 30 \\ &= 4 \cdot 30 + 30 \\ &= 150 \end{aligned}$$

Cevap: D

10.



$$x + y = ?$$

Kural: Şeklin içindeki açılarn toplamı, dışındaki açılarn toplamına eşittir.

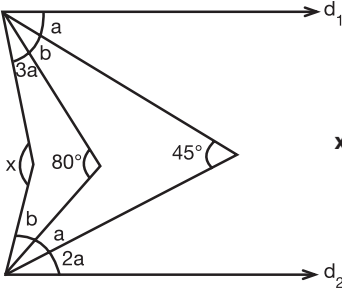
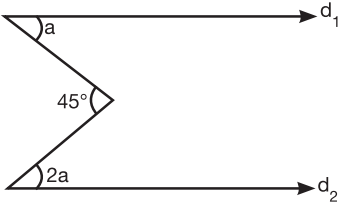
$$\begin{aligned} 100 + 20 + 60 + 30 + 10 &= x + y + 80 \\ x + y &= 140^\circ \end{aligned}$$

Cevap: A

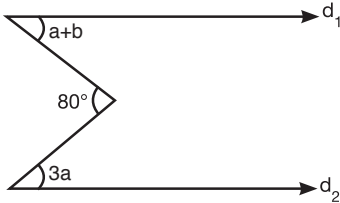


AÇI

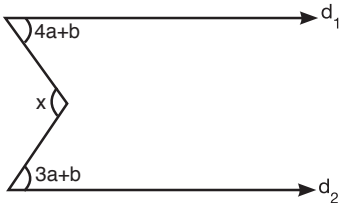
11.

 $x = ?$ 

$$\begin{aligned} a + 2a &= 45 \\ 3a &= 45 \\ a &= 15^\circ \end{aligned}$$



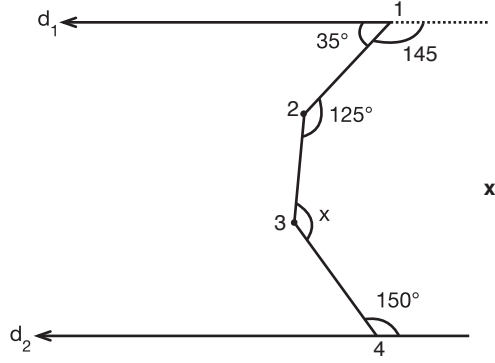
$$\begin{aligned} a + b + 3a &= 80 \\ 4a + b &= 80 \\ 4 \cdot 15 + b &= 80 \\ b &= 20^\circ \end{aligned}$$



$$\begin{aligned} x &= 4a + b + 3a + b \\ x &= 7a + 2b \\ x &= 7 \cdot 15 + 2 \cdot 20 \\ x &= 105 + 40 \\ x &= 145^\circ \end{aligned}$$

Cevap: B

12.

 $x = ?$

KURAL: İki paralel doğru arasında kalan ve aynı yöne bakan açılarının toplamı:

(Kırık nokta sayısı - 1) · 180

Kırık nokta sayısı = 4

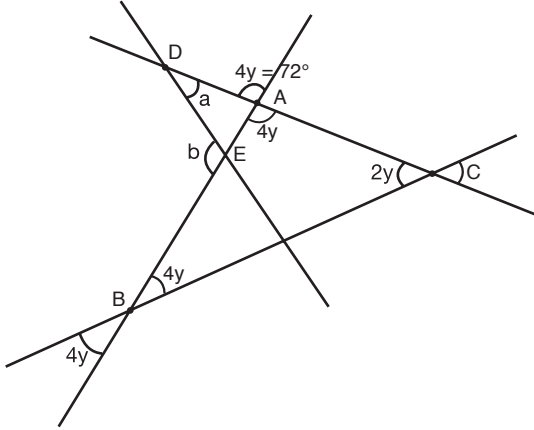
$$x + 145 + 125 + 150 = (4 - 1) \cdot 180$$

$$x = 120$$

Cevap: C

AÇI – ÜÇGENDE AÇI

1.



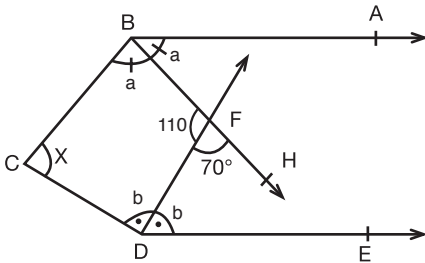
ABC üçgeninin iç açıları toplamı 180° olduğundan
 $4y + 4y + 2y = 180 \Rightarrow y = 18$
 $4y = 72$

ADE üçgeninde iki iç açının toplamı kendilerine komşu olmayan bir dış açıya eşit olduğundan,
 $a + 108 = b \Rightarrow b - a = 108^\circ$ dir.

$$\begin{array}{r} b + a = 132 \\ + \quad b - a = 108 \\ \hline 2b = 240 \\ b = 120, \quad a = 12^\circ \text{ dir.} \end{array}$$

Cevap: A

2.

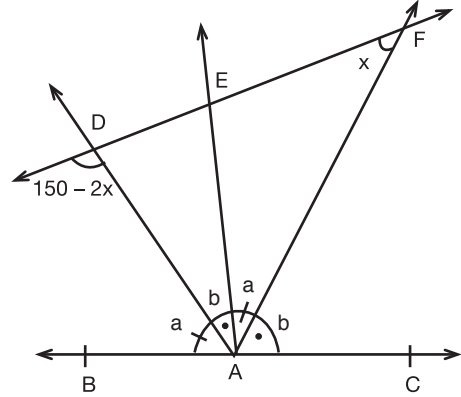


$2a + x + 2b = 360$ ve $a + b + x + 110 = 360$
 (-1 ile çarp) $a + b + x = 250^\circ$
 (2 ile genişlet)

$$\begin{array}{r} 2a + 2b + 2x = 500 \\ + \quad -2a - 2b - x = -360 \\ \hline x = 140 \end{array}$$

Cevap: E

3.



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

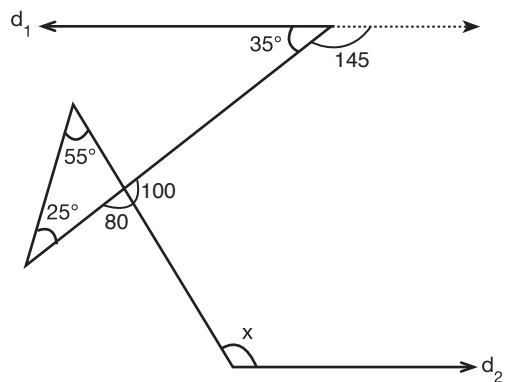
$m(\widehat{DAF}) = 90^\circ$

$$\begin{array}{r} x + 90 = 150 - 2x \quad (\widehat{DAF}) \\ 3x = 60 \\ x = 20^\circ \end{array}$$

Cevap: C

TASARI & DEV KADRO

4.

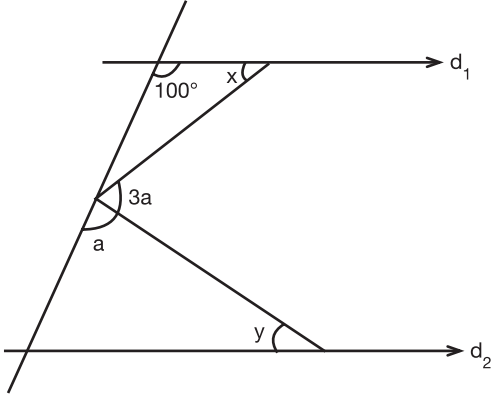


$$145 + 100 + x = 360 \Rightarrow x = 115^\circ$$

Cevap: C

AÇI – ÜÇGENDE AÇI

5.



$$3 / x + 100 = 4a \Rightarrow 3x + 300 = 12a$$

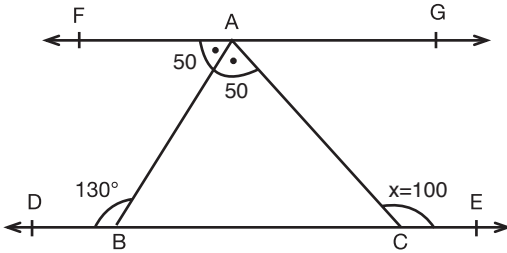
$$4 / x + y = 3a \Rightarrow 4x + 4y = 12a$$

$$3x + 300 = 4x + 4y$$

$$x + 4y = 300$$

Cevap: D

6.

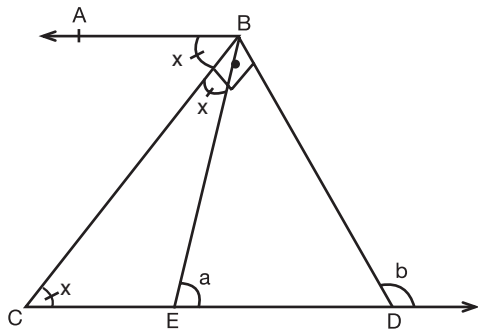


$$m(\widehat{FAB}) = 50 \text{ (Karşı durumlu açılar)}$$

$$m(\widehat{FAC}) = m(\widehat{ACE}) \text{ (İç ters açılar)}$$

Cevap: B

7.



$$b = 90 + x$$

$$x = b - 90$$

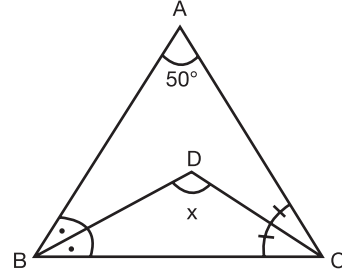
$$a = 2x$$

$$a = 2(b - 90)$$

$$a = 2b - 180$$

Cevap: A

8.



I. yol:

$$x = 90 + \frac{m(\widehat{A})}{2} \Rightarrow x = 90 + \frac{50}{2}$$

$$x = 115^\circ$$

II. yol:

$$50 + 2a + 2b = 180$$

$$2a + 2b = 130$$

$$2(a + b) = 130$$

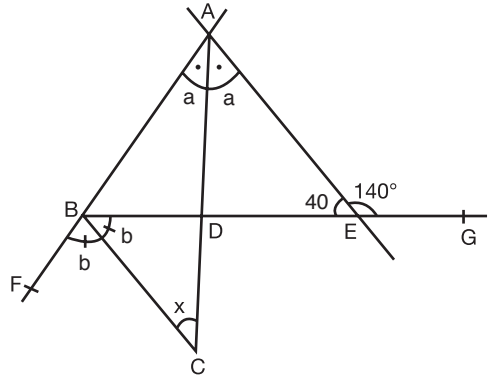
$$a + b = 65$$

$$x + \underbrace{a + b}_{65} = 180^\circ$$

$$x = 115^\circ$$

Cevap: C

9.



I. yol:

$$x = \frac{m(\widehat{AEB})}{2} = \frac{40}{2} = 20^\circ$$

II. yol:

$$2a + 40 = 2b \Rightarrow 2b - 2a = 40 \text{ } (\widehat{AEB})$$

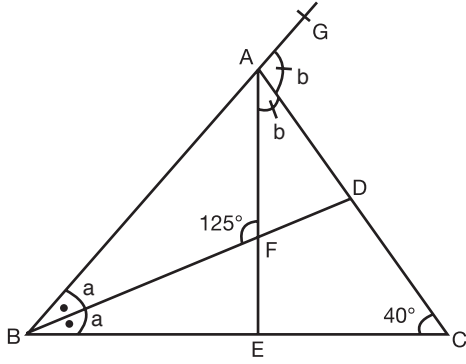
$$b - a = 20$$

$$a + x = b \Rightarrow x = b - a = 20^\circ \text{ } (\widehat{ABC})$$

Cevap: B

AÇI – ÜÇGENDE AÇI

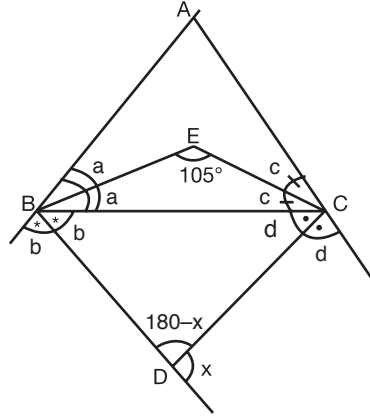
10.



$$\begin{aligned} \bullet 2a + 40 &= b \quad (\widehat{ABC}) & \bullet a + b + 40 &= 125 \\ & & a + b &= 85 \\ & & b &= 85 - a \\ \Rightarrow 2a + 40 &= 85 - a & m(\widehat{ABC}) &= 2a = 30^\circ \\ 3a &= 45 \\ a &= 15 \end{aligned}$$

Cevap: E

12.



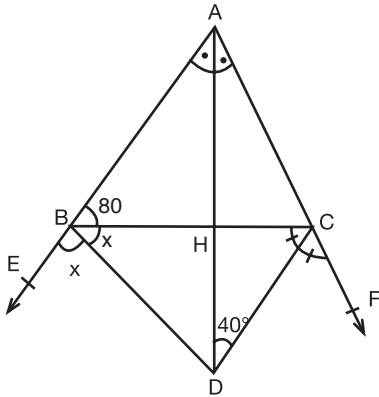
$$\begin{aligned} 2a + 2b &= 180 & 2c + 2d &= 180 \\ a + b &= 90 & c + d &= 90 \end{aligned}$$

EBCD dörtgeninin iç açıları toplamı 360° dir.

$$\begin{aligned} 105 + 90 + 90 + 180 - x &= 360 \\ x &= 105^\circ \end{aligned}$$

Cevap: A

11.

**Kural:**

[AD] ve [CD] açıortay ise [BD]'de açıortaydır.

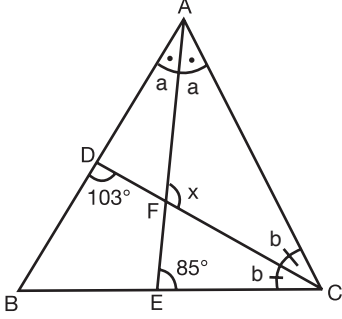
$$\begin{aligned} m(\widehat{ADC}) &= \frac{m(\widehat{ABC})}{2} \Rightarrow 40 = \frac{m(\widehat{ABC})}{2} \\ \Rightarrow m(\widehat{ABC}) &= 80^\circ \end{aligned}$$

$$\begin{aligned} 2x + 80 &= 180^\circ \\ 2x &= 100^\circ \\ x &= 50^\circ \end{aligned}$$

Cevap: C

ÜÇGENDE AÇI

1.



$$2a + b = 103 \quad (\widehat{ADC})$$

$$a + 2b + 85 = 180 \quad (\widehat{AEC}) \Rightarrow a + 2b = 95$$

$$2a + b = 103$$

$$+ a + 2b = 95$$

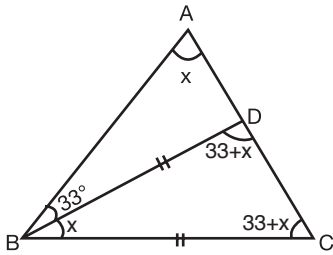
$$\underline{3a + 3b = 198} \Rightarrow 3(a + b) = 198 \text{ olur.}$$

$$a + b = 66$$

$$\underline{a + b} + x = 180 \quad (\widehat{AFC})$$

$$\frac{66}{x} = 114^\circ$$

2.



$$|AB| = |AC|$$

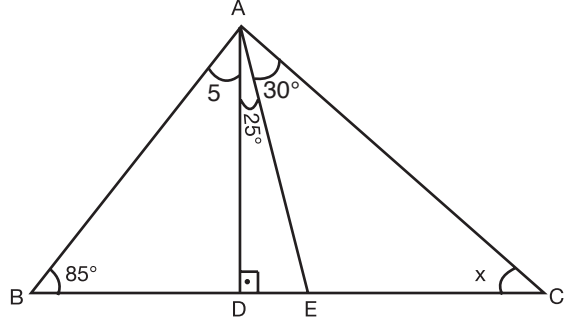
$$|BD| = |BC|$$

$$x + (33 + x) + (33 + x) = 180^\circ$$

$$3x = 114$$

$$x = 38^\circ$$

3.



I. yol:

$$m(\widehat{BAE}) = m(\widehat{EAC}) = 30^\circ$$

$$x + 55 + 90 = 180$$

$$x = 35^\circ$$

II. yol:

$$m(\widehat{DAE}) = \frac{|m(\widehat{B}) - m(\widehat{C})|}{2}$$

$$25 = \frac{|85 - x|}{2}$$

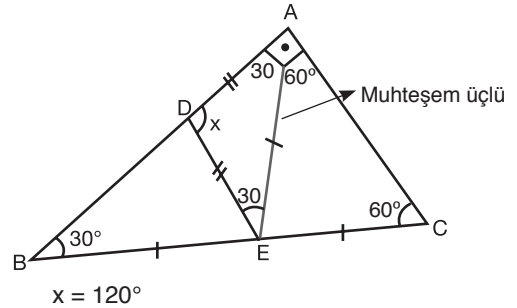
$$x = 35$$

Cevap: D

TASARI & DEV KADRO

Cevap: B

4.



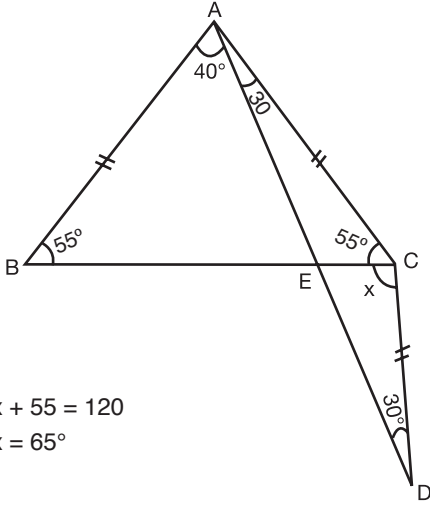
$$x = 120^\circ$$

Cevap: A

Cevap: D

ÜÇGENDE AÇI

5.

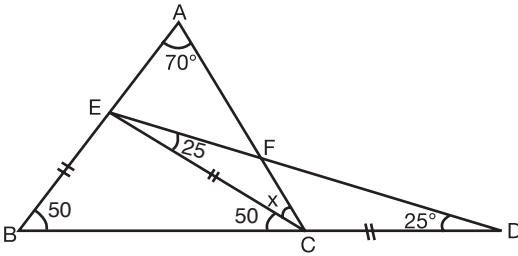


$$x + 55 = 120$$

$$x = 65^\circ$$

Cevap: A

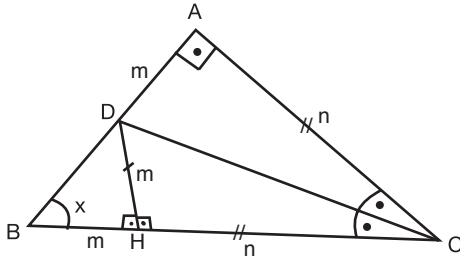
6.



$$70 + 50 + 50 + x = 180 \Rightarrow x = 10^\circ$$

Cevap: B

7.



$$|BC| = |AD| + |AC|$$

$$m + n = m + n$$

Kural

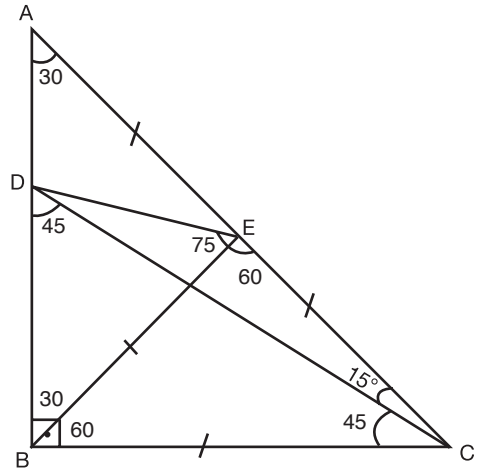
Açıortay üzerinden kollara indirilen dikmelerin uzunlukları ve açıortay kollarının uzunlukları birbirine eşittir.

$m = |AD| = |DH|$ ve $n = |AC| = |HC|$ dir.

Dolayısıyla $|BH| = m$ dir. Yani BDH üçgeni ikizkenar dik üçgendir. $x = 45^\circ$

Cevap: D

8.



\widehat{DBC} ikizkenar dik üçgen $|DB| = |BC|$

\widehat{DBE} ikizkenar üçgen $|DB| = |BE|$

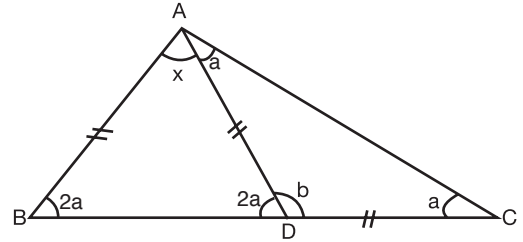
$$m(\widehat{DBE}) = 30 \Rightarrow m(\widehat{DBE}) = m(\widehat{DEB}) = 75^\circ$$

$$x = 60^\circ + 75^\circ = 135^\circ$$

Cevap: E

TASARI & DEV KADRO

9.



$$2a + b = 180$$

$$+ b - 2a = 48$$

$$2b = 228$$

$$b = 114 \text{ ve } a = 33$$

$$4a + x = 180$$

$$4 \cdot 33 + x = 180$$

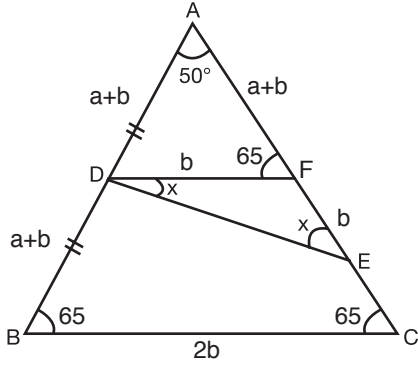
$$x = 180 - 132$$

$$x = 48^\circ$$

Cevap: D

ÜÇGENDE AÇI

10.



$$|AB| = |AC| = 2a + 2b$$

$$|EC| + |BC| = |AE|$$

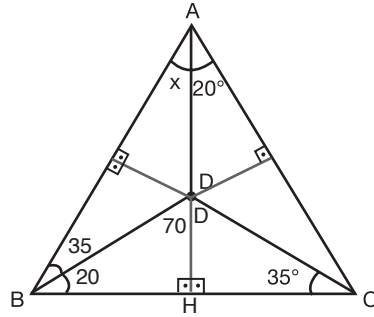
$$a + 2b = a + 2b$$

[DF] orta taban

$$|DF| = \frac{|BC|}{2} = b$$

$$2x = 65 \Rightarrow x = 32,5^\circ$$

12.



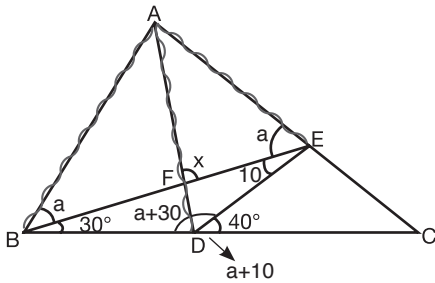
$$x = 35^\circ (\widehat{ABH})$$

Cevap: A

Cevap: B

TASARI & DEV KADRO

11.



$$(a + 30) + (a + 10) + 40 = 180$$

$$2a + 80 = 180$$

$$2a = 100$$

$$a = 50$$

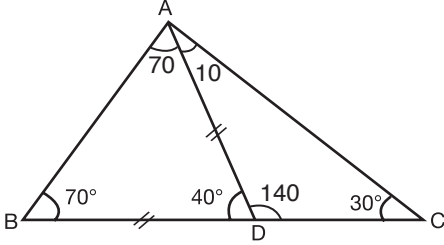
$$x = a + 10 + 10$$

$$x = 70^\circ$$

Cevap: E

AÇI - KENAR BAĞINTILARI

1.


 \widehat{ABD} için $|AD| = |BD| > |AB|$
 \widehat{ADC} için $|AC| > |AD| > |DC|$
 \widehat{ABC} için $|BC| > |AC| > |AB|$

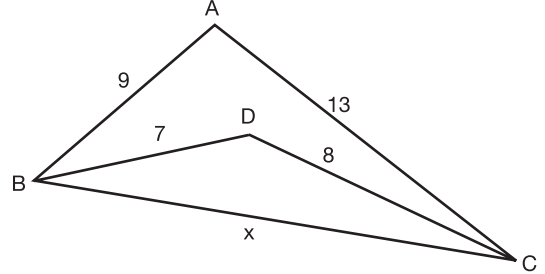
Sonuç olarak;

 $|BC| > |AC| > |AD| = |BD| > |AB|$ ve

 $|AD| > |DC|$ dir. $|DC| > |AD|$ ifadesi yanlıştır.

Cevap: C

3.


 \widehat{ABC} iken $|13 - 9| < x < |13 + 9|$
 $4 < x < 22$
 \widehat{BDC} iken $|8 - 7| < x < |18 + 7|$
 $1 < x < 15$

Sonuç olarak

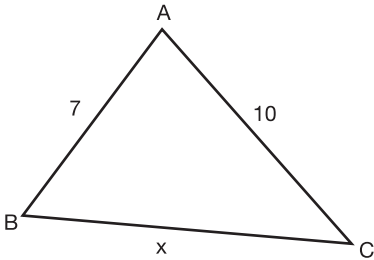
 $4 < x < 15$ olmalıdır. (En dar aralık seçilir.)

 x 'in alabileceği 10 farklı değer vardır.

Cevap: A

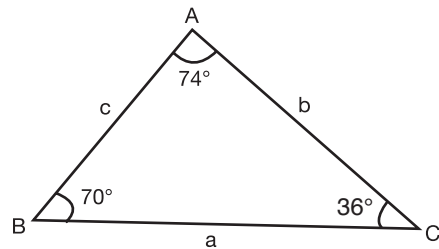
TASARI & DEV KADRO

2.

Genel kurala göre $3 < x < 17$
 $m(\widehat{B}) < m(\widehat{A})$ için $10 < x$
Sonuç olarak $10 < x < 17$ olmalıdır.
 x 'in alabileceği 6 farklı değer vardır.

Cevap: B

4.

 $c < b < a$ dir.
 $|a - b| - |b - c| - |c - a|$

↓

↓

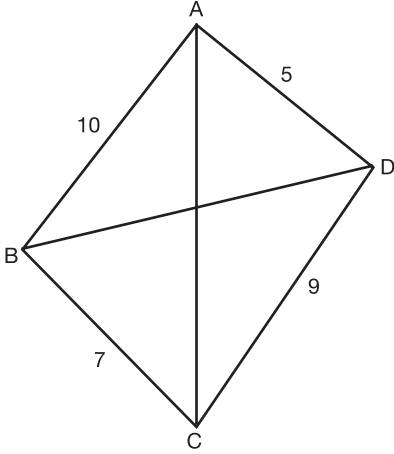
↓

 $b < a$ $c < b$ $c < a$
 $(a - b) - (b - c) - (a - c) = a - b - b + c - a + c$
 $= 2c - 2b$

Cevap: E

AÇI - KENAR BAĞINTILARI

5.


 \widehat{ABD} için $5 < |BD| < 15$
 \widehat{BCD} için $2 < |BD| < 16$
Sonuç olarak $5 < |BD| < 15$ olmalıdır.
 \widehat{ABC} için $3 < |AC| < 17$
 \widehat{ADC} için $4 < |AC| < 14$
Sonuç olarak $4 < |AC| < 14$ olmalıdır.

$$5 < |BD| < 15$$

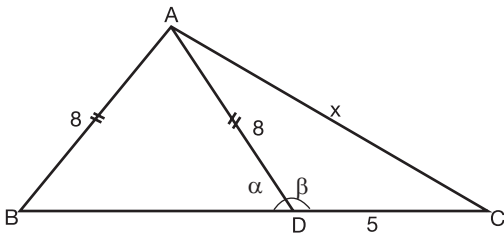
$$+ \quad 4 < |AC| < 14$$

$$\hline 9 < |BD| + |AC| < 29$$

 $|BD| + |AC|$ 'nin alabileceği en büyük değer 28 dir.

Cevap: C

6.


 $\alpha < 90^\circ$ olmalıdır. Dolayısıyla $\beta > 90^\circ$ dir. Yani \widehat{ADC} 'ni geniş açılı üçgendir.

$$89^2 + 5^2 < x^2 \quad \text{ve} \quad 3 < x < 13$$

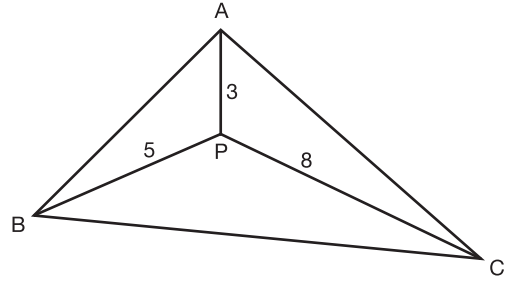
$$89 < x^2$$

$$\sqrt{89} < x$$

Sonuç olarak $\sqrt{89} < x < 13$ tür.
 x 'in alabileceği en küçük değer 10'dur.

Cevap: B

7.

**Kural**

$$|AP| + |BP| + |CP| < \widehat{ABC} < 2 \cdot (|AP| + |BP| + |CP|)$$

$$3 + 5 + 8 < \widehat{ABC} < 2 \cdot (3 + 5 + 8)$$

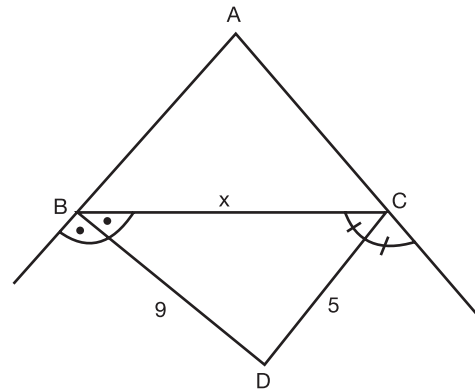
$$16 < \widehat{ABC} < 32 \text{ olmalıdır.}$$

 $\widehat{ABC} = 33$ olamaz.

Cevap: E

TASARI & DEV KADRO

8.



$$m(\widehat{D}) = 90 - \frac{m(\widehat{A})}{2} \text{ 'dir. Yani } \widehat{D} \text{ dar açıdır.}$$

Buna göre

$$x^2 < 9^2 + 5^2 \quad \text{ve} \quad 4 < x < 13$$

$$x^2 < 106$$

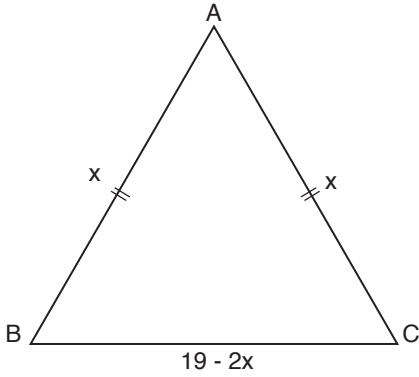
$$x < \sqrt{106}$$

Sonuç olarak $4 < x < \sqrt{106}$ ($\sqrt{106} = 10, \dots$)
 x 'in alabileceği tamsayı değerleri 5, 6, 7, 8, 9, 10'dur.

Cevap: B

AÇI - KENAR BAĞINTILARI

9.



$$|19 - 2x - x| < x < |19 - 2x + x|$$

$$\text{I. } |19 - 3x| < x < |19 - x|$$

II.

$$\text{I. için } 19 - 3x < x \quad \text{II. için } x < 19 - x$$

$$19 < 4x$$

$$2x < 19$$

$$\frac{19}{4} < x$$

$$x < \frac{19}{2}$$

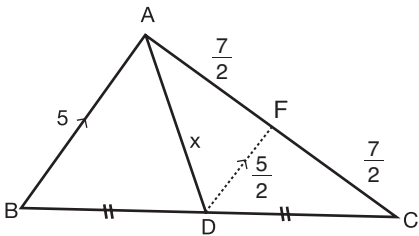
$$\text{Sonuç olarak } \frac{19}{4} < x < \frac{19}{2}$$

$$4. \dots < x < 9.5 \dots$$

x'in alabileceği tamsayı değerleri 5, 6, 7, 8, 9 dur.

Cevap: E

10.



[DF] // [AB] çizilir. (Orta taban)

$$|AF| = |FC| = \frac{7}{2}$$

$$|DF| = \frac{|AB|}{2} = \frac{5}{2} \text{ dir.}$$

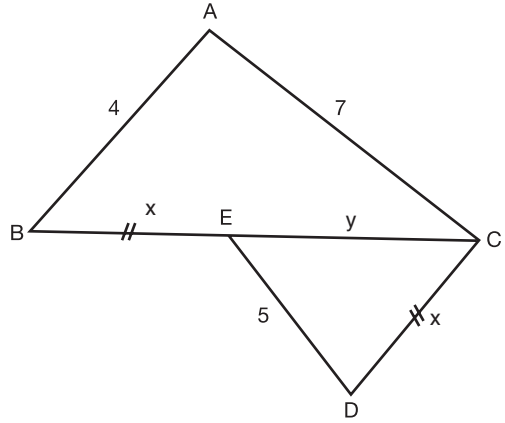
$$\widehat{ADF} \text{ için } \left| \frac{7}{2} - \frac{5}{2} \right| < x < \left| \frac{7}{2} + \frac{5}{2} \right|$$

x'in alabileceği tamsayı değerleri 2, 3, 4, 5 tir.

$$2 + 3 + 4 + 5 = 14 \text{ tür.}$$

Cevap: C

11.



$$\widehat{ABC} \text{ için } |7 - 4| < |BC| < |7 + 4|$$

$$3 < |BC| < 11 \text{ dir.}$$

$$3 < x + y < 11$$

$$\widehat{EDC} \text{ için } |x - y| < 5 < |x + y|$$

Sonuç olarak $5 < x + y < 11$ olmalıdır.

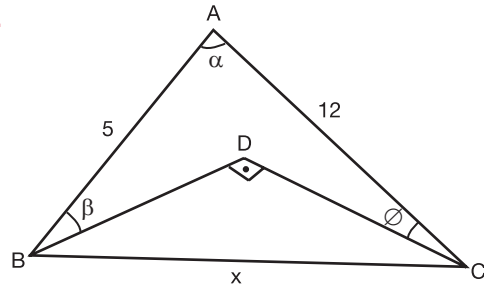
$$5 < |BC| < 11$$

|BC| 'nin alabileceği 5 farklı değer vardır.

Cevap: A

TASARI & DEV KADRO

12.



$\alpha + \beta + \gamma = 90$ olduğundan $\alpha < 90$ dir diyebiliriz.

Yani \widehat{ABC} üçgeni dar açılı üçgendir.

$$x^2 < 5^2 + 12^2 \quad \text{ve} \quad |12 - 5| < x < |12 + 5|$$

$$x^2 < 169$$

$$7 < x < 17$$

$$x < \sqrt{169}$$

$$x < 13$$

Sonuç olarak

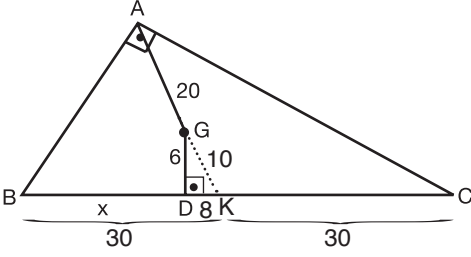
$7 < x < 13$ olmalıdır. x'in alabileceği en büyük tamsayı değeri 12'dir.

Cevap: E



KENARORTAY

1.



$$IAGI = 2 IGKI \Rightarrow IGKI = 10 \text{ br}$$

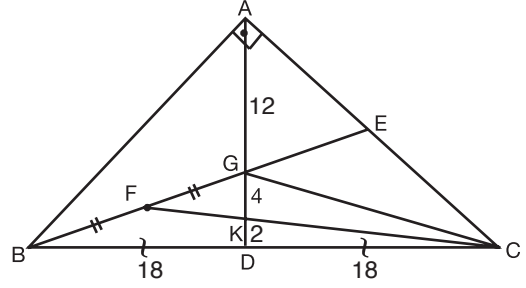
\widehat{GDK} üçgeninde $IDKI = 8$ br (6, 8, 10 üçgeni)

$m(\widehat{A}) = 90^\circ \Rightarrow IAKI = IBKI = IKCI = 30$ br (Muhteşem üçlü)

$x = 22$ br'dir.

Cevap: E

3.



BGC üçgeninde $[GD]$ ve $[FC]$ kenarortay olduğundan K noktası bu üçgenin ağırlık merkezidir.

$$2 IKDI = IGKI \Rightarrow IKDI = 2 \text{ br}$$

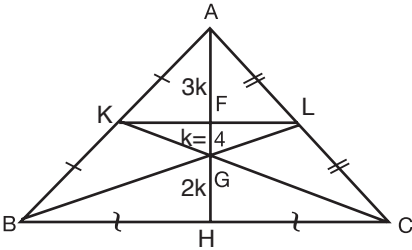
$$2 IGDI = IAGI \Rightarrow IAGI = 12 \text{ br}$$

$m(\widehat{A}) = 90^\circ$ ve $IADI = 18$ br $\Rightarrow IBCI = 36$ br (Muhteşem üçlü)

Cevap: E

TASARI & DEV KADRO

2.



$$k = 4 \text{ ise } 6k = 24 \text{ 'tür.}$$

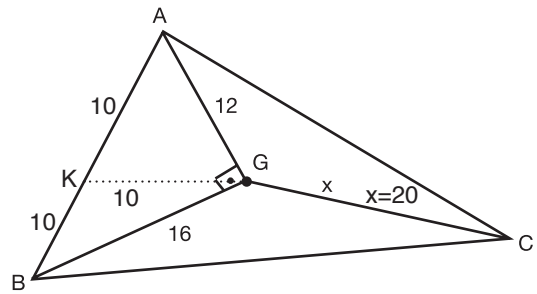
Not: • $[KL]$ orta tabandır. Yani $IAFI = IFHI$

• G ağırlık merkezidir. Yani $2 IGHI = IAGI$ 'dir.

Bu iki eşitliği sağlayan oran $(3k, k, 2k)$

Cevap: C

4.



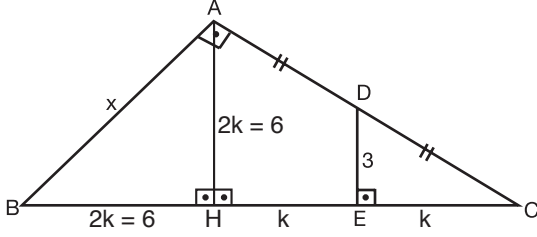
\widehat{ABD} için $IABI = 20$ br (12, 16, 20 üçgeni) $IKGI = 10$ br (Muhteşem üçlü)

$$x = IGCI = 2 IKGI = 20 \text{ br}$$

Cevap: D

KENARORTAY

5.



$$4 IEI = IBCI$$

$$IEI = k \text{ dersek } IBCI = 4k \text{ olur.}$$

[AH] dikmesini indirirsek $IHEI = IEI = k$ olur.

Dolayısıyla $IBHI = 2k$ olur. (\widehat{AHC})

\widehat{ABC} 'de $m(\widehat{A}) = 90^\circ$ ve $IBHI = IHCI$ olduğundan

$IAHI = 2k$ olur. (Muhteşem üçlü)

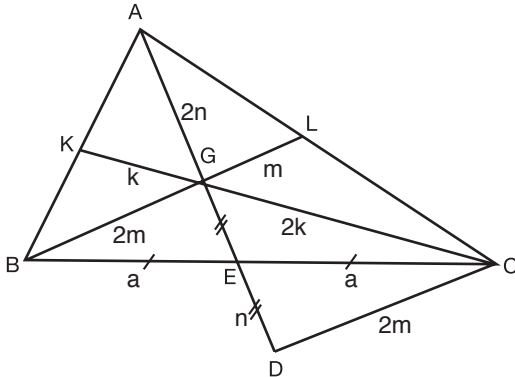
\widehat{AHC} 'de $IAHI = 2 IEI$ olduğundan $IAHI = 6$ br

\widehat{ABH} üçgeni ikizkenar dik üçgendir.

$$x = 6\sqrt{2} \text{ br'dir.}$$

Cevap: C

6.



$$IAEI + IBLI + IKCI = 36 \text{ br} \quad IGEI = IEDI$$

$$3k + 3m + 3n = 36$$

$$3(k + m + n) = 36$$

$$k + m + n = 12 \text{ br}$$

\widehat{EBG} ve \widehat{ECD} üçgenleri eş üçgenleri

(Kenar - Açılı - Kenar)

Dolayısıyla $IDCI = 2m$ br'dir.

$$\text{Ç(GDC)} = 2k + 2m + 2n$$

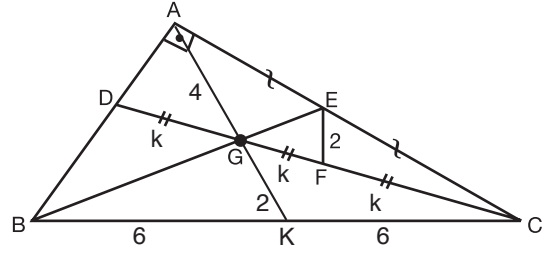
$$= 2(k + m + n)$$

$$= 2 \cdot 12$$

$$= 24 \text{ br'dir.}$$

Cevap: A

7.



$$IDGI = IFCI = k \text{ dersek}$$

$$2. IDGI = IGCI \text{ olduğundan } IGFI = k \text{ olur.}$$

AGC üçgeninde [EF] orta taban olduğundan $IADI = 4$ br'dir. $IGKI = 2$ br ve $IAKI = 6$ br olur.

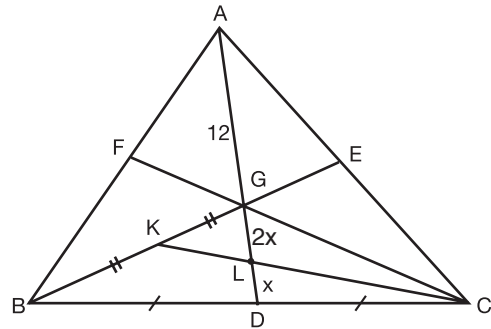
$$IBCI = 2 IAKI \text{ (Muhteşem üçlü)}$$

$$IBCI = 2 \cdot 6 = 12 \text{ br}$$

Cevap: C

TASARI & DEV KADRO

8.



BGC üçgeninde [KC] ve [GD] kenarortay olduğundan L noktası bu üçgenin ağırlık noktasıdır.

$$ILDI = x \Rightarrow IGLI = 2x \text{ tir.}$$

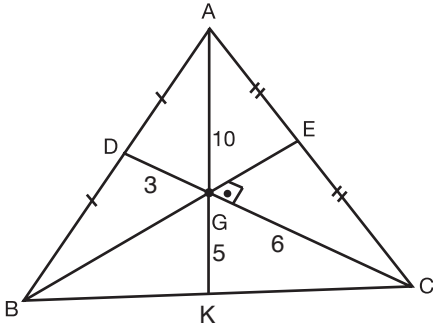
$$ABC \text{ üçgeninde } IAGI = 12, \quad IGD I = 3x = 6 \text{ br}$$

$$\Rightarrow x = 2 \text{ br'dir.}$$

Cevap: B

KENARORTAY

9.



$V_b \perp V_c$ olduğundan $V_a^2 = V_b^2 + V_c^2$ 'dir.

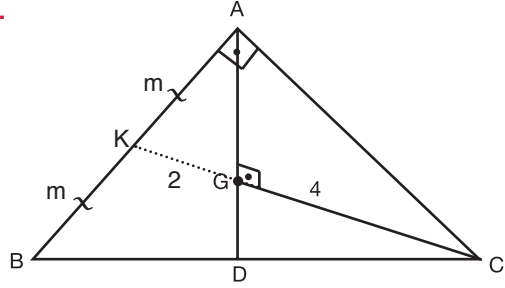
$$V_a = 15 \text{ br} \quad V_c = 9 \text{ br} \quad V_b = ?$$

$$15^2 = 9^2 + V_b^2$$

$$V_b^2 = 144 \Rightarrow V_b = |BE| = 12 \text{ br'dir.}$$

Cevap: C

11.



AKC üçgeninde öklid teoremi uygularsak

$$m^2 = 2(2 + 4) = 12$$

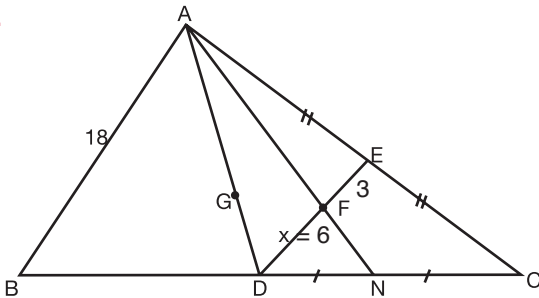
$$m^2 = 12$$

$$m = 2\sqrt{3} \quad x = 2m = 2 \cdot 2\sqrt{3}$$

$$x = 4\sqrt{3}$$

Cevap: B

10.



ADC üçgeninde F noktası ağırlık merkezidir.

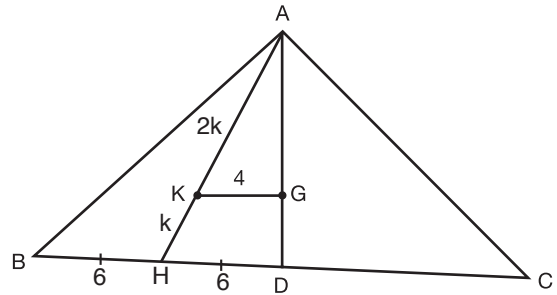
ABC üçgeninde [DE] orta tabandır.

$$|DE| = \frac{|AB|}{2} = 9 \text{ br'dir.} \quad |FE| = 3 \text{ br}$$

$$|DF| = x = 6 \text{ br'dir.}$$

Cevap: E

12.



AHD üçgeninde benzerlik uygularsak

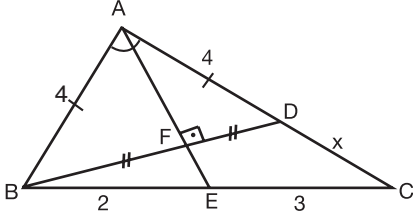
$$\frac{|AK|}{|AH|} = \frac{2k}{3k} = \frac{|KG|}{|HD|} \Rightarrow |HD| = 6 \text{ br}$$

$$|BD| = |DC| = 12 \text{ br} \Rightarrow |BC| = 24 \text{ br'dir.}$$

Cevap: D

AÇIORTAY

1.



ABC üçgeninde

[AF] yükseklik ve kenarortay ise aynı zamanda açıortaydır ve ABD üçgeni ikizkenar üçgendir.

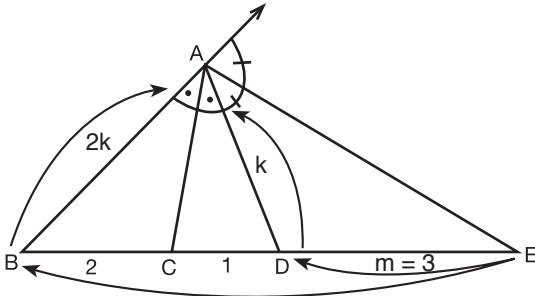
$$|AB| = |AD| = 4 \text{ br}$$

ABC üçgeninde iç açıortay teoremine göre

$$\frac{|AB|}{|BE|} = \frac{|AC|}{|EC|} \text{ dir. } \frac{4}{2} = \frac{4+x}{3} \Rightarrow x = 2 \text{ br}$$

Cevap: D

2.



ABC üçgeninde iç açıortay teoremine göre

$$\frac{|AB|}{|AD|} = \frac{|BC|}{|CD|} = \frac{2}{1} \quad |AB| = 2k \text{ dersek} \\ |AD| = k \text{ olur.}$$

ABD üçgeninde dış açıortay teoremine göre

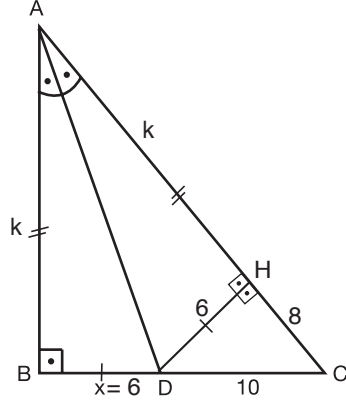
$$\frac{|DE|}{|BE|} = \frac{|AD|}{|AB|} = \frac{1}{2} \quad |DE| = m \text{ dersek} \\ |BE| = 2m \text{ olur.}$$

$$2m = 3 + m \Rightarrow m = 3 \text{ t'ür.}$$

$$\frac{|BC|}{|BE|} = \frac{2}{6} = \frac{1}{3}$$

Cevap: C

3.



$|AB| = k$ dersek $|AE| = k + 8$ olur.

Açıortay üzerindeki aynı noktadan kollara indirilen dikmeler kolları aynı oranda böler ve uzunlukları eşittir.

Dolayısıyla

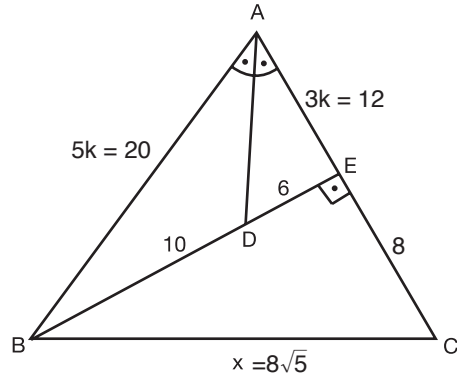
$|AB| = |AH| = k$ ve $|BD| = |DH| = x$ 'tir.

$|HC| = 8$ ve DHC dik üçgeninde $(6, 8, 10)$

$|DH| = x = 6$ br'dir.

Cevap: C

4.



ABD üçgenin iç açıortay teoremine göre

$$\frac{|AB|}{|AE|} = \frac{|BD|}{|DE|} = \frac{10}{6} \text{ dir. } |AB| = 5k \text{ dersek} \\ |AE| = 3k \text{ olur.}$$

ABD dik üçgeni $(12, 16, 20)$ üçgenidir.

$|AB| = |AC|$ olduğundan $|EC| = 8$ br'dir.

EBC dik üçgeninde pisagor uygulanırsa

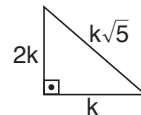
$$|EB|^2 + |EC|^2 = |BC|^2$$

$$16^2 + 8^2 = x^2$$

$$x = 8\sqrt{5}$$

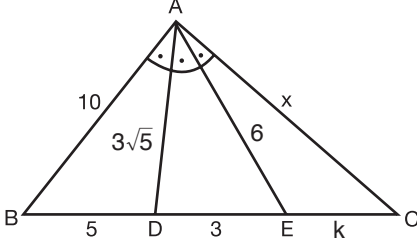
Cevap: D

Not:



AÇIORTAY

5.



ABE üçgeninde iç açıortay teoremine göre

$|AE| = 6$ br'dir.

ABE üçgeninde iç açıortay uzunluk teoremine göre

$$|AD|^2 = |AB| \cdot |AE| - |BD| \cdot |DE|$$

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

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

ADC üçgeninde $\frac{|AD|}{|DE|} = \frac{|AC|}{|EC|} = \frac{3\sqrt{5}}{3} = \sqrt{5}$ tir.

$|AC| = k\sqrt{5}$ dersek $|EC| = k$ olur.

ADC üçgeninde iç açıortay uzunluk teoremine göre

$$|AE|^2 = |AD| \cdot |AC| - |DE| \cdot |EC|$$

$$6^2 = 3\sqrt{5} \cdot k\sqrt{5} - 3 \cdot k$$

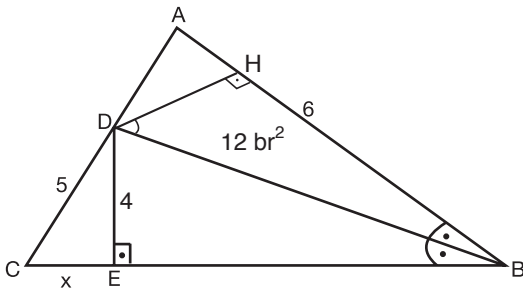
$$36 = 12k$$

$$k = 3$$

$$x = k\sqrt{5} = 3\sqrt{5} \text{ 'tir.}$$

Cevap: C

6.



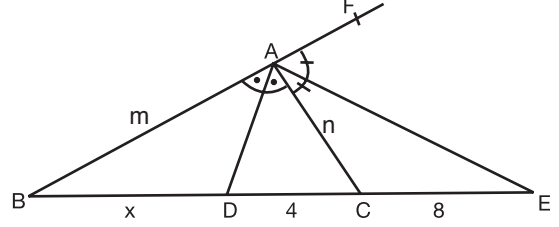
$$A(\triangle ABD) = 12 \text{ br}^2 \Rightarrow \frac{|DH| \cdot 6}{2} = 12 \text{ ve } |DH| = 4 \text{ br}$$

$|DH| = |DE|$ olduğundan $|DE| = 4$ br'dir.

DEC üçgeni (3, 4, 5) üçgenidir. $x = 3$ br'dir.

Cevap: C

7.



ABC üçgenin iç açıortay teoremine göre

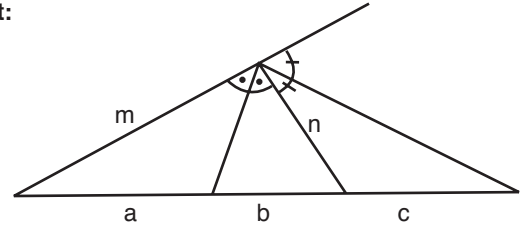
$$\frac{m}{n} = \frac{x}{4}$$

Dış açıortay teoremine göre $\frac{m}{n} = \frac{x+12}{8}$ dir.

$$\frac{x}{4} = \frac{x+12}{8} \Rightarrow x = 12 \text{ br'dir.}$$

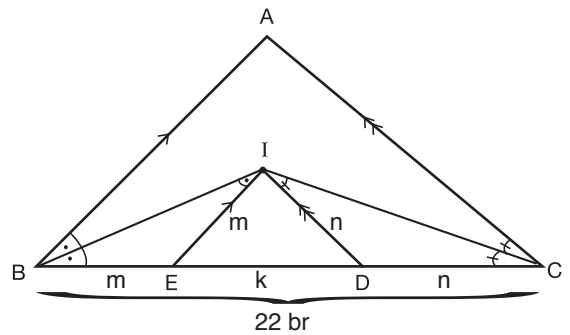
Cevap: D

Not:



$$\frac{a-b}{a+b} = \frac{b}{c} \text{ dir. } \left(\frac{x-4}{x+4} = \frac{4}{8}, x = 12 \text{ br} \right)$$

8.

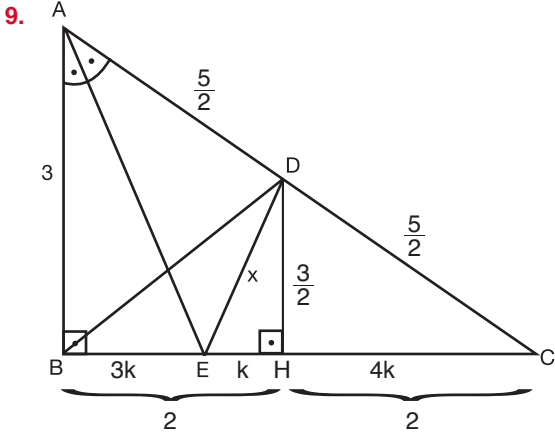


$m + k + n = 22 \text{ br}$ ve $\angle(IE) = m + k + n$ olduğundan $\angle(IE) = 22 \text{ br'dir.}$

Cevap: A



AÇIORTAY



$$m(\widehat{B}) = 90^\circ \text{ ve } |BD| = |AD| = \frac{5}{2} \Rightarrow |DC| = \frac{5}{2}$$

(Muhteşem üçlü)

ABC dik üçgeni (3, 4, 5) üçgenidir.

$$|DH| = \frac{3}{2} \text{ 'dir.}$$

(Orta taban olduğundan) $|BH| = |HC| = 2$ 'dir.

ABC üçgeninde iç açıortay teoremine göre

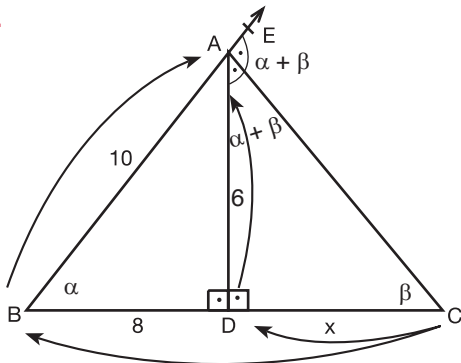
$$\frac{|AB|}{|AC|} = \frac{|BE|}{|EC|} = \frac{3}{5} \quad |BE| = 3k \text{ dersek} \\ |EC| = 5k \text{ olur.}$$

$$3k + 5k = 4 \Rightarrow k = \frac{1}{2}$$

DHE dik üçgenin pisagor uygulanırsa

$$x^2 = \left(\frac{3}{2}\right)^2 + \left(\frac{1}{2}\right)^2 = \frac{10}{4} \Rightarrow x = \frac{\sqrt{10}}{2} \text{ 'dir.}$$

10.



ABD dik üçgeni (6, 8, 10) üçgenidir. $|AD| = 6$ br

ABC üçgeninde \widehat{EAC} dış açısı $m(\widehat{B}) + m(\widehat{C})$ eşit olduğundan $m(\widehat{EAC}) = \alpha + \beta$ 'dir.

ABD üçgeninde dış açıortay teoremine göre

$$\frac{x}{x+8} = \frac{6}{10} = \frac{3}{5}$$

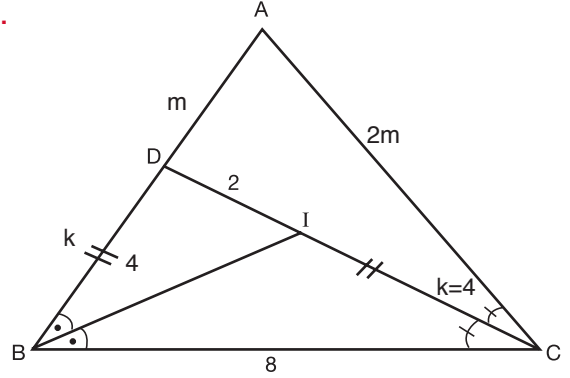
$$5x = 3x + 24$$

$$2x = 24$$

$$x = 12 \text{ br'dir.}$$

Cevap: A

11.



BDC üçgeninde iç açıortay teoremine göre

$$\frac{k}{2} = \frac{8}{k} \quad k^2 = 16 \Rightarrow k = 4 \text{ 'tür.}$$

ABC üçgeninde iç açıortay teoremine göre

$$\frac{|BC|}{|BD|} = \frac{|AC|}{|AD|} = \frac{8}{4} = 2 \quad |AC| = 2m \text{ dersek} \\ |AD| = m \text{ olur.}$$

ABC üçgeninde iç açıortay uzunluk teoremine göre

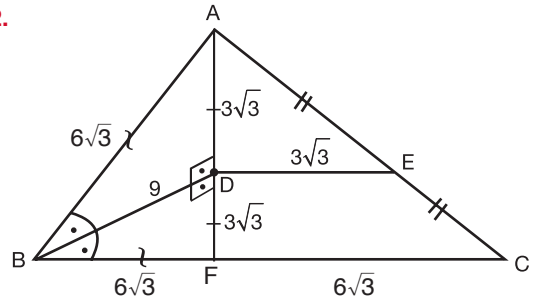
$$|DC|^2 = |AC| \cdot |BC| - |AD| \cdot |BD|$$

$$6^2 = 2m \cdot 8 - m \cdot 4$$

$$36 = 12m \quad x = 2m = 6 \text{ br}$$

Cevap: B

12.



[AF] uzunluğu çizilirse

AFC üçgeninde [DE] orta taban olur.

$$2 \cdot |DE| = |FC| \Rightarrow |FC| = 6\sqrt{3}, |BF| = 6\sqrt{3} \text{ olur.}$$

ABF üçgeninde [BD] hem açıortay hem kenarortay olduğundan aynı zamanda yükseklik olur.

ABF üçgeni ikizkenar üçgen olmuş olur.

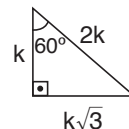
$$|AB| = |BF| = 6\sqrt{3} \text{ 'tür.}$$

ABD üçgeninde pisagor uygulanırsa $|AD| = 3\sqrt{3}$ olduğu görülür. ABD üçgeni (30, 60, 90) üçgenidir.

$$m(\widehat{ABD}) = 30^\circ \text{ dir.}$$

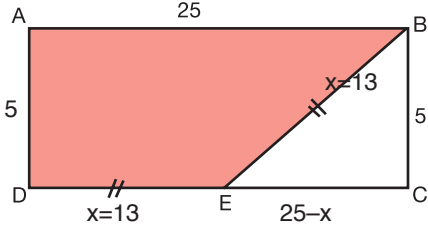
Cevap: C

Not:



DİK ÜÇGEN

1.



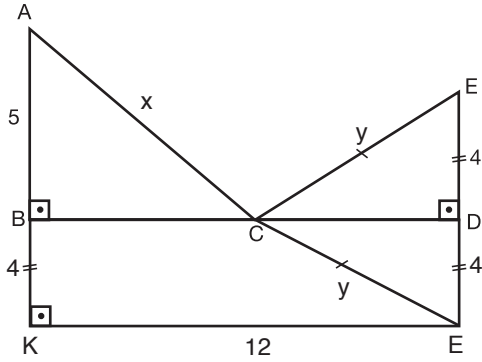
BEC üçgeni (5, 12, 13) üçgenidir.

$x = 13$ 'tür.

$\text{Ç(ADEB)} = 5 + 25 + 13 + 13 = 56$ br

Cevap: E

2.

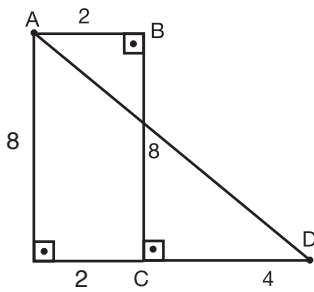


AKE üçgeni (9, 12, 15) üçgenidir.

$\text{IACI} + \text{ICEI} = x + y = 15$ 'dir.

Cevap: C

3.

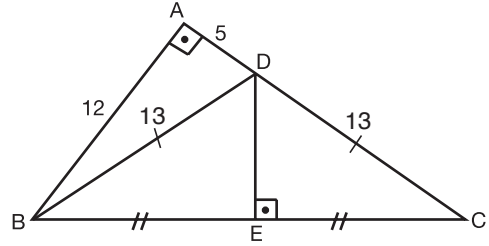


AHD üçgeni (6, 8, 10) üçgenidir.

$\text{IADI} = 10$ br'dir.

Cevap: B

4.



ABD üçgeni (5, 12, 13) üçgenidir.

DBC üçgeninde [DE] hem yükseklik, hem kenarortay olduğundan DBC üçgeni ikizkenar üçgendir.

$\text{IDCI} = 13$ br

ABC dik üçgeninde pisagor uygularsak

$$12^2 + 18^2 = \text{IBC}I^2$$

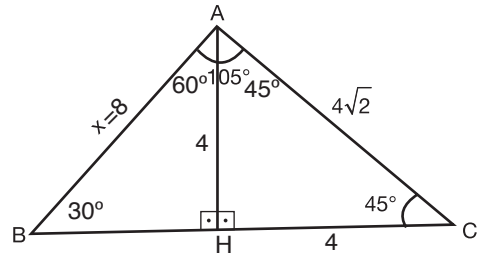
$$468 = \text{IBC}I^2$$

$$\text{IBC}I = 6\sqrt{13} \text{ 'tür.}$$

Cevap: C

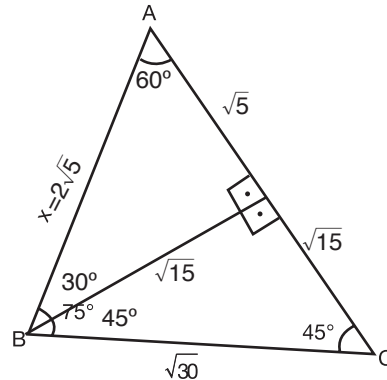
TASARI & DEV KADRO

5.



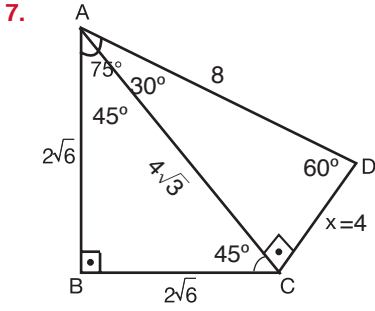
Cevap: E

6.

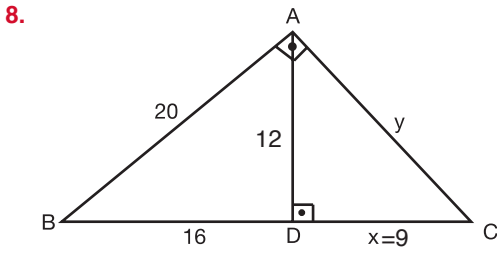


Cevap: A

DİK ÜÇGEN



Cevap: D



ABD üçgeni (12, 16, 20) üçgenidir. $IADI = 12$ br.

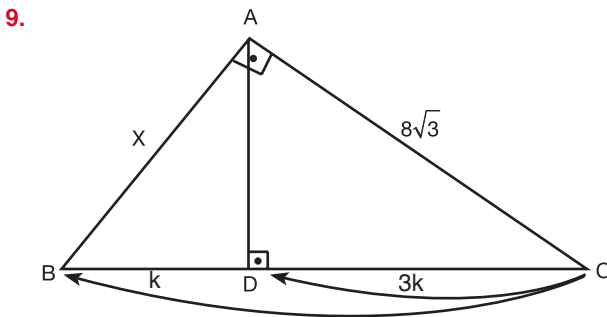
ABC üçgeninde öklid teoremi gereği

$$12^2 = 16 \cdot x \Rightarrow x = 9 \text{ br}$$

ADC üçgeni (9, 12, 15) üçgenidir. $IACI = y = 15$ br'dir.

$$x + y = 9 + 15 = 24 \text{ br'dir.}$$

Cevap: D



\widehat{ABC} 'de öklid teoremi gereği

$$(8\sqrt{3})^2 = 3k \cdot 4k$$

$$192 = 12k^2$$

$$k^2 = 16$$

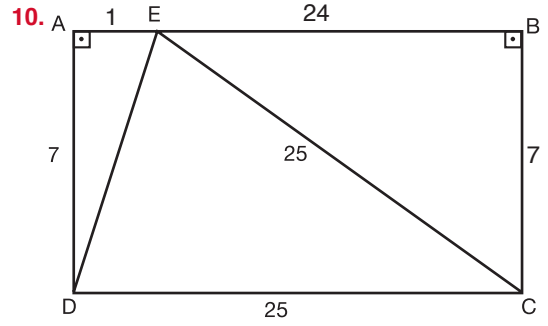
$$k = 4 \text{ br'dir.}$$

$$x^2 = k \cdot 4k$$

$$x^2 = 4 \cdot 16 = 64$$

$$x = 8 \text{ br'dir.}$$

Cevap: C

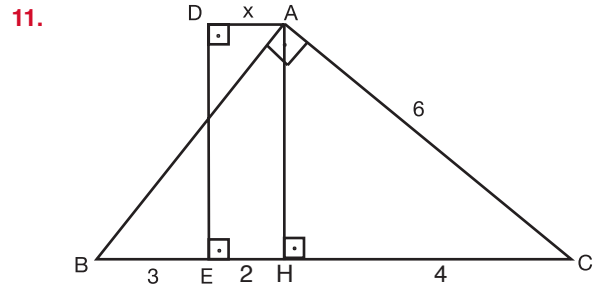


\widehat{EBC} (7, 24, 25) üçgenidir. $IEBI = 24$ br

$$IAEI = 1 \text{ br'dir.}$$

Cevap: A

TASARI & DEV KADRO



\widehat{ABC} 'de öklid gereği

$$IACI^2 = IHCI \cdot IBCI$$

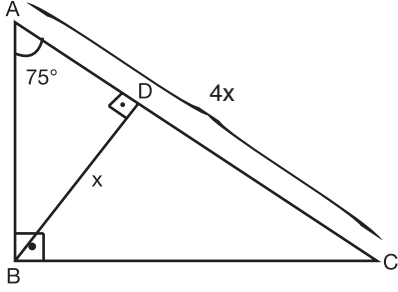
$$6^2 = IHCI \cdot 9 \Rightarrow IHCI = 4 \text{ br}$$

$$AHED \text{ dikdörtgeninde } IADI = IEHI = x = 2 \text{ br}$$

Cevap: B

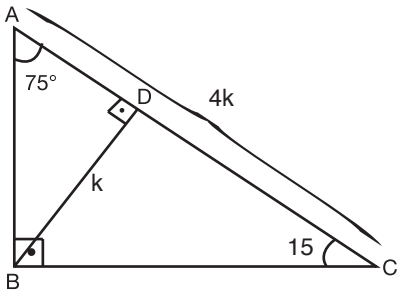
DİK ÜÇGEN

12.



(15, 75, 90) üçgenin dik köşeden hipotenüze indirilen dikme hipotenüsün $\frac{1}{4}$ 'ne eşittir.
 $x + 4x = 25 \Rightarrow x = 5$ br'dir.

Not:

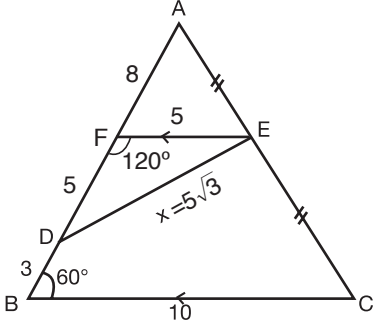


(15, 75, 90) üçgenin dik köşeden hipotenüze indirilen dikme hipotenüsün $\frac{1}{4}$ 'ine eşittir.
 $x + 4x = 25 \Rightarrow x = 5$ br'dir.

Cevap: B

ÖZEL ÜÇGENLER

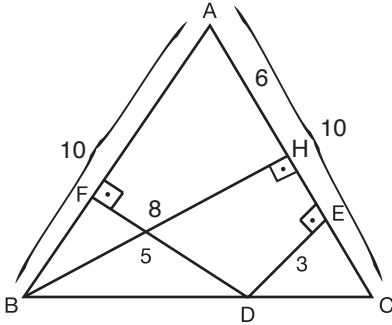
1.



[EF] orta taban $IFBI = IFAI = 8$ br
ve $IEFI = \frac{|BC|}{2} = \frac{10}{2} = 5$ br dir.
FDE üçgeni (30, 30, 120) üçgendir.
 $x = 5\sqrt{3}$ 'tür.

Cevap: C

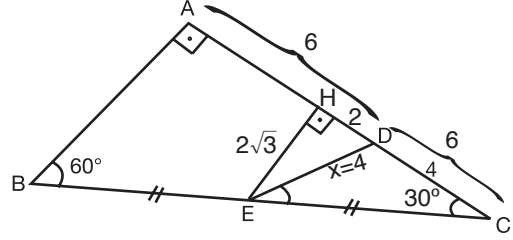
2.



ABC ikizkenar üçgeninde
 $IBHI = IFDI + IEDI = 5 + 3 = 8$ br'dir.
ABH üçgeni (6, 8, 10) üçgenidir.
 $IAHI = 6$, $IHCI = 4$ br'dir.
BHC üçgeninde pisagor uygulanırsa
 $IBHI^2 + IHCI^2 = IBCI^2$
 $8^2 + 4^2 = IBCI^2$
 $IBC I = 4\sqrt{5}$ br'dir.

Cevap: E

3.



[HE] orta taban olduğundan $IAHI = IHCI = 6$ br
ve $IHDI = 2$ br'dir.

HEC üçgeni (30, 60, 90)'dir.

$IHCI = 6$ br \Rightarrow $IHEI = 2\sqrt{3}$ br

HED üçgeninde pisagor uygulanırsa

$$IHDI^2 + IHEI^2 = x^2$$

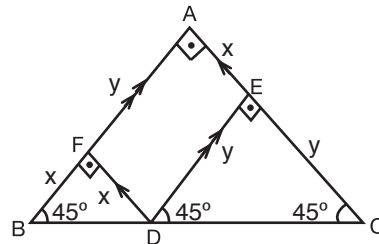
$$2^2 + (2\sqrt{3})^2 = x^2$$

$$x = 4$$
 br

Cevap: B

TASARI & DEV KADRO

4.



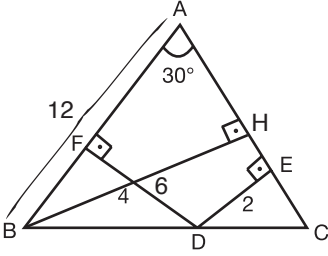
$x + y = 5\sqrt{2}$ br ve ABC ikizkenar dik üçgen olduğundan

$$IBC I = (5\sqrt{2}) \cdot \sqrt{2} = 10$$
 br'dir.

Cevap: E

ÖZEL ÜÇGENLER

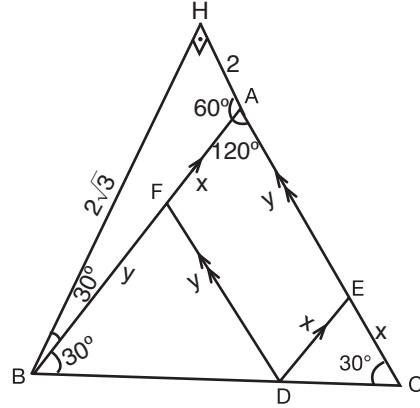
5.



$IBHI = IFDI + IDEI = 4 + 2 = 6$ br
 ABH üçgeni (30, 60, 90) üçgenidir.
 $IBHI = 6$ br \Rightarrow $IABI = 12$ br'dir.

Cevap: D

7.

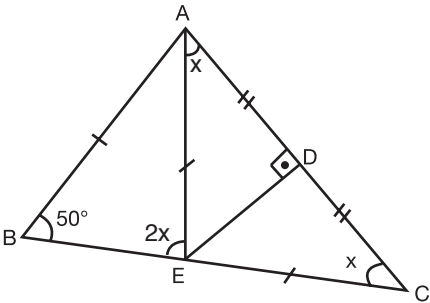


B'nin [AC]'ye en kısa uzaklığı B'den AC'ye indirilen dikmenin uzunluğudur. $IBHI = 2\sqrt{3}$ 'tür.
 ABH üçgeni (30, 60, 90) üçgenidir.
 $IBHI = 2\sqrt{3} \Rightarrow IABI = x + y = IDEI + IDFI = 4$ br'dir.

Cevap: C

TASARI & DEV KADRO

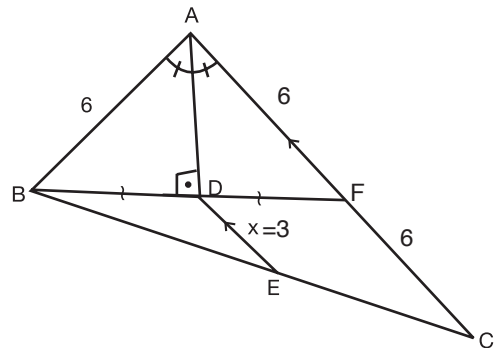
6.



AEC ikizkenar üçgendir $IAEI = IEIC$
 BAE ikizkenar üçgendir. $m(\hat{B}) = m(\hat{E})$
 $50 = 2x \Rightarrow x = 25^\circ$

Cevap: A

8.

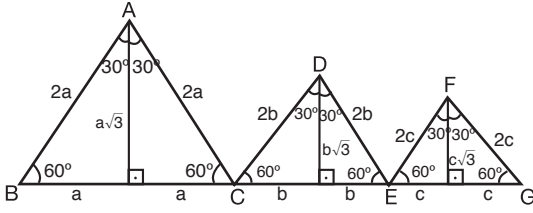


ABF üçgeni ikizkenardır. $IABI = IAFI = 6$ br'dir.
 $IFCI = 6$ br olur.
 BFC üçgeninde $[DE] = x$ orta tabandır.
 $|DE| = \frac{|FC|}{2} = \frac{6}{2} = 3$ br'dir.

Cevap: C

ÖZEL ÜÇGENLER

9.



$$a\sqrt{3} + b\sqrt{3} + c\sqrt{3} = 4\sqrt{3} \Rightarrow \sqrt{3}(a + b + c) = 4\sqrt{3}$$

$$a + b + c = 4 \text{ tür.}$$

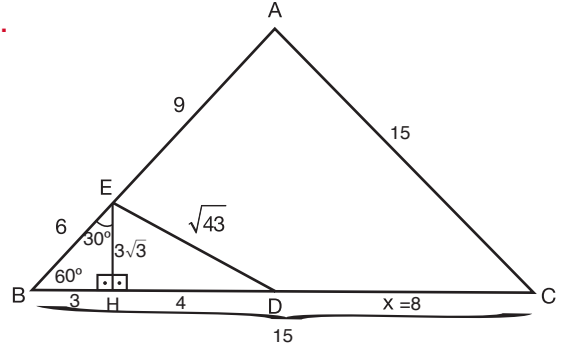
$$\text{Ç}(ABC) + \text{Ç}(DCE) + \text{Ç}(FEG) = 6(a + b + c)$$

$$= 6 \cdot 4$$

$$= 24 \text{ br'dir.}$$

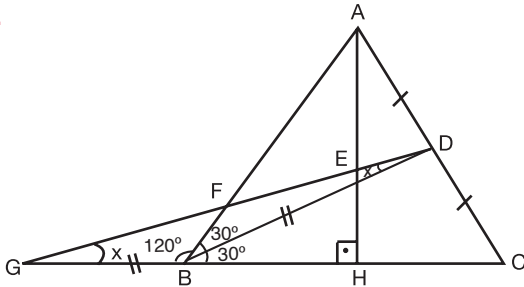
Cevap: D

11.



Cevap: A

10.

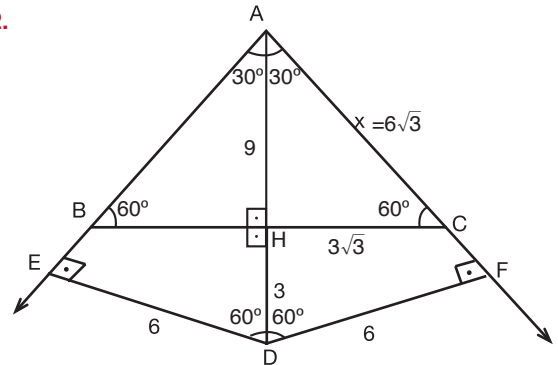


$$IAHI = IBDI = IGBI \text{ dir.}$$

$$\text{GBD üçgeninde } m(B) = 150^\circ \Rightarrow x = 15^\circ \text{ dir.}$$

Cevap: D

12.

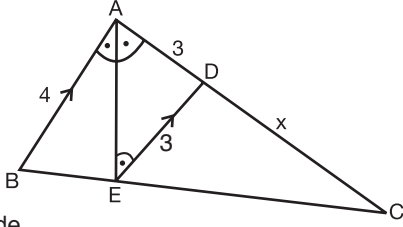


AED (30°, 60° 90°) üçgeninde
IEDI = 6 br ise IADI = 12 br'dir. IAHI = 9 br'dir. AHC
(30, 60, 90) üçgeninde
IAHI = 9 br ise IACI = x = 6√3 br'dir.

Cevap: B

ÜÇGENDE BENZERLİK

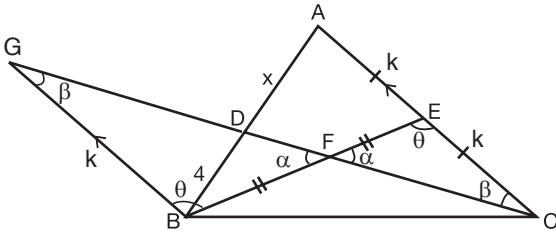
1.

 \widehat{ABC} 'de

$$\frac{|DE|}{|AB|} = \frac{|CD|}{|AC|}, \quad \frac{3}{4} = \frac{x}{x+3} \Rightarrow x = 9 \text{ br}$$

Cevap: E

2.

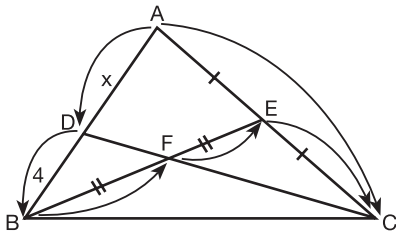


GBD üçgeni FEC üçgenine eşittir. $|GB| = k$ br
GBD ve CAD üçgenleri benzerdir.

$$\frac{|GB|}{|AC|} = \frac{|BD|}{|AD|}, \quad \frac{k}{2k} = \frac{4}{x} \Rightarrow x = 8 \text{ br'dir.}$$

Cevap: E

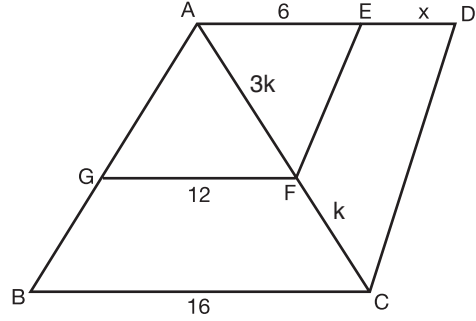
2. yol
Menelaus Teoremi



$$\frac{|EC|}{|AC|} \cdot \frac{|AD|}{|AB|} \cdot \frac{|BF|}{|FE|} = 1$$

$$\frac{1}{2} \cdot \frac{x}{4} \cdot \frac{1}{1} = 1 \quad x = 8 \text{ br}$$

3.



$$\widehat{ABC}$$
'de $\frac{|GF|}{|BC|} = \frac{|AF|}{|AC|}, \quad \frac{12}{16} = \frac{3}{4}$

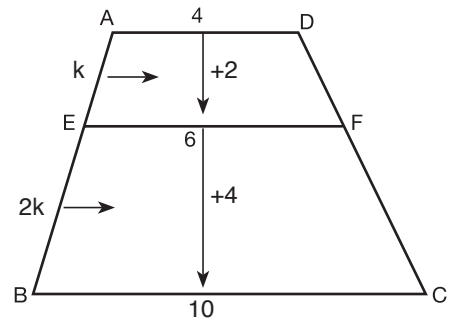
IAFI = 3k dersek IACI = 4k olur.

$$\widehat{ACD}$$
'de $\frac{|AF|}{|FC|} = \frac{|AE|}{|ED|}, \quad \frac{3k}{k} = \frac{6}{x} \Rightarrow x = 2$ 'dir.

Cevap: B

TASARI & DEV KADRO

4.



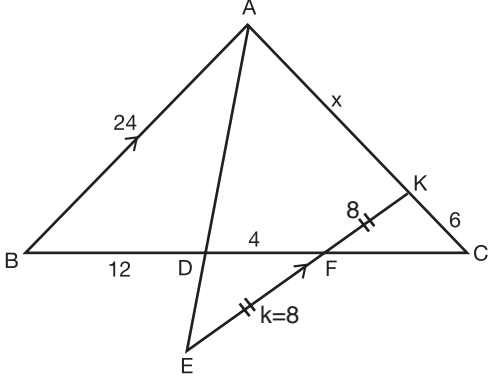
k da 2 br artarsa

2k'da 4 br artar $|BC| = 10$ br'dir.

Cevap: C

ÖZEL ÜÇGENLER

5.

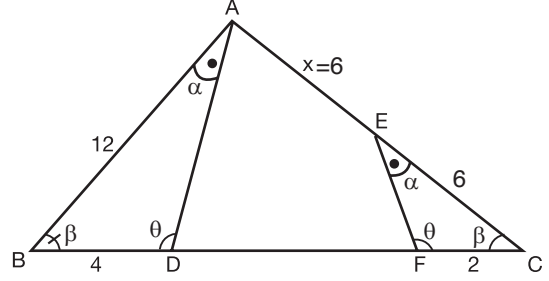


$$\frac{|DF|}{|BD|} = \frac{|EF|}{|AB|}, \frac{4}{12} = \frac{k}{24} \Rightarrow k = 8 \text{ dir.}$$

$$\widehat{ABC}'\text{de } \frac{|KC|}{|AC|} = \frac{|KF|}{|AB|}, \frac{8}{24} = \frac{6}{6+x} \\ \Rightarrow x = 12 \text{ br'dir.}$$

Cevap: A

7.

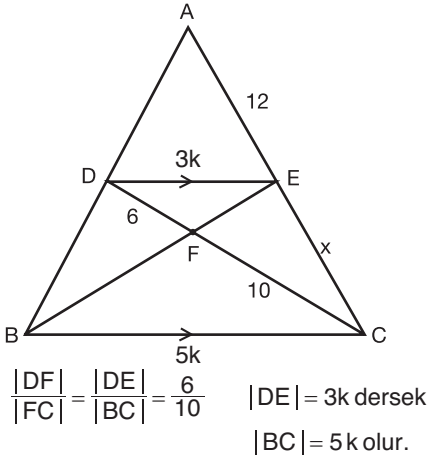

 $\widehat{ABD} \approx \widehat{ECF}'\text{dir.}$

$$\frac{|BD|}{|FC|} = \frac{|AB|}{|EC|}, \frac{4}{2} = \frac{12}{|EC|} \Rightarrow |EC| = 6 \text{ br}$$

$|AB| = |AC| = 12$ br olduğundan $x = 6$ br'dir.

Cevap: C

6.

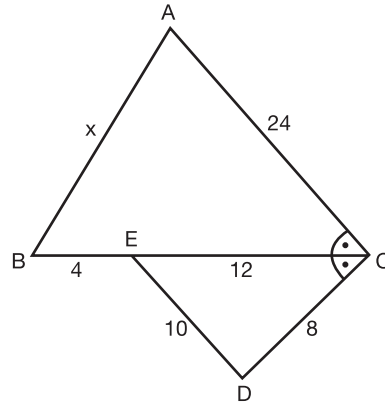


$$\frac{|DF|}{|FC|} = \frac{|DE|}{|BC|} = \frac{6}{10} \quad |DE| = 3k \text{ dersek} \\ |BC| = 5k \text{ olur.}$$

$$\widehat{ABC}'\text{de } \frac{|DE|}{|BC|} = \frac{|AE|}{|AC|}, \frac{3k}{5k} = \frac{12}{12+x} \\ \Rightarrow 36 + 3x = 60 \\ 3x = 24 \\ x = 8$$

Cevap: D

8.


 $\widehat{CAB} \approx \widehat{CED}$ (K. A. K)

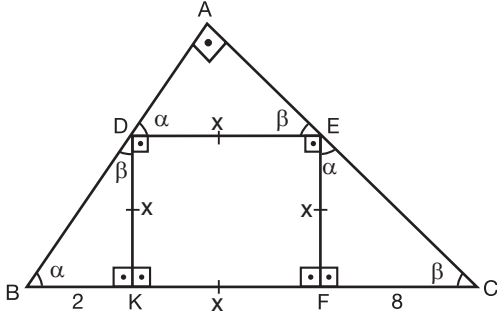
$$\frac{|CA|}{|CE|} = \frac{|AB|}{|ED|} = \frac{|CB|}{|CD|} \Rightarrow \frac{24}{12} = \frac{x}{10} = \frac{16}{8} \\ x = 20$$

Cevap: E



ÖZEL ÜÇGENLER

9.


 $\widehat{KBD} \approx \widehat{FEC}$ 'dir.

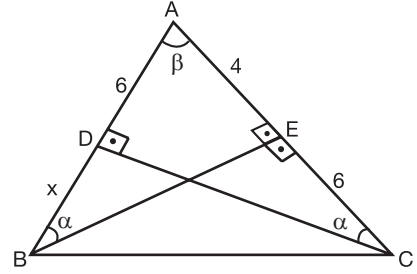
$$\frac{|BK|}{|EF|} = \frac{|DK|}{|FC|}, \frac{2}{x} = \frac{x}{8} \Rightarrow x^2 = 16$$

$$x = 4 \text{ br'dir.}$$

$$A(\text{DEFK}) = x^2 = 16 \text{ br}^2$$

Cevap: C

11.


 $\widehat{EBA} \approx \widehat{DCA}$ 'dir.

$$\frac{|EA|}{|DA|} = \frac{|BA|}{|CA|}, \frac{4}{6} = \frac{x+6}{10}$$

$$20 = 3x + 18$$

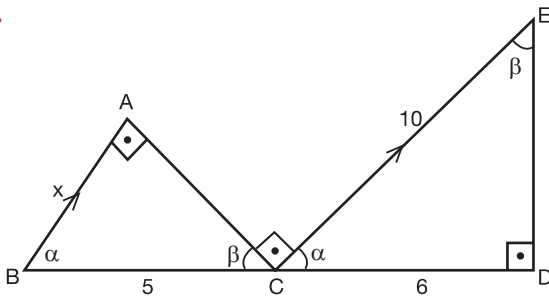
$$3x = 2$$

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

Cevap: A

TASARI & DEV KADRO

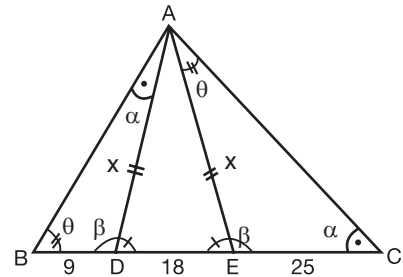
10.



$$\frac{|AB|}{|CD|} = \frac{|BC|}{|CE|}, \frac{x}{6} = \frac{5}{10} \Rightarrow x = 3 \text{ br}$$

Cevap: D

12.


 $\widehat{ADB} \approx \widehat{CEA}$

$$\frac{|BD|}{|EA|} = \frac{|AD|}{|CE|}, \frac{9}{x} = \frac{x}{25} \Rightarrow x^2 = 9.25$$

$$x = 15$$

$$\begin{aligned} \text{Ç}(\text{ADE}) &= 2x + 18 \\ &= 30 + 18 \\ &= 48 \text{ br} \end{aligned}$$

Cevap: D