

ÇÖZÜMLER

$$\begin{aligned}
 1. \quad 3 - \frac{\left(\frac{1}{3} - 1\right) : \frac{1}{3}}{\left(\frac{1}{4} - 1\right) : \frac{3}{4}} &= 3 - \frac{-\frac{2}{3} : \frac{1}{3}}{-\frac{3}{4} : \frac{3}{4}} \\
 &= 3 - \frac{-\frac{2}{3} \cdot \frac{3}{1}}{-1} \\
 &= 3 - \frac{-2}{-1} \\
 &= 3 - 2 = 1 \text{ bulunur.}
 \end{aligned}$$

Cevap: B

$$\begin{aligned}
 2. \quad \left(\frac{864 + 8,64}{86,4}\right) : \left(\frac{432 + 4,32}{43,2}\right) \\
 &= \left(\frac{864}{86,4} + \frac{8,64}{86,4}\right) : \left(\frac{432}{43,2} + \frac{4,32}{43,2}\right) \\
 &= \left(\frac{8640}{864} + \frac{864}{8640}\right) : \left(\frac{4320}{432} + \frac{432}{4320}\right) \\
 &= \left(10 + \frac{1}{10}\right) : \left(10 + \frac{1}{10}\right) \\
 &= 1 \text{ bulunur.}
 \end{aligned}$$

Cevap: A

$$\begin{aligned}
 3. \quad \left(\left(-\frac{3}{4}\right)^{-2}\right)^3 \cdot \left(\left(\frac{4}{3}\right)^3\right)^{-2} \\
 &= \left(-\frac{3}{4}\right)^{-6} \cdot \left(\frac{4}{3}\right)^{-6} \\
 &= \left(\frac{4}{3}\right)^6 \cdot \left(\frac{3}{4}\right)^6 = \left(\frac{4}{3} \cdot \frac{3}{4}\right)^6 \\
 &= 1^6 \\
 &= 1 \text{ bulunur.}
 \end{aligned}$$

Cevap: C

$$\begin{aligned}
 4. \quad \frac{3^{24} - 3^{12}}{(3^6 + 1)(3^6 - 1)} &= \frac{3^{12}(3^{12} - 1)}{(3^6)^2 - 1} \\
 &= \frac{3^{12} \cancel{(3^{12} - 1)}}{\cancel{(3^{12} - 1)}} \\
 &= 3^{12}
 \end{aligned}$$

Cevap: E

$$\begin{aligned}
 5. \quad \left(-\frac{1}{2}\right)^{1-2n} \cdot (-2)^{2n+1} \cdot \left(\frac{1}{16}\right)^{-n} &= 256 \\
 -2^{2n-1} \cdot -2^{2n+1} \cdot \left(\frac{1}{2^4}\right)^{-n} &= 256 \\
 -2^{2n-1} \cdot -2^{2n+1} \cdot 2^{4n} &= 256 \\
 2^{8n} &= 2^8 \\
 8n = 8 &\Rightarrow n = 1
 \end{aligned}$$

Cevap: C

$$\begin{aligned}
 6. \quad \frac{\frac{8}{\sqrt{5}-1} + \frac{4}{\sqrt{3}+1}}{\frac{1}{\sqrt{5}+1} \cdot \frac{1}{\sqrt{3}-1}} \\
 &= \frac{8(\sqrt{5}+1) + 4(\sqrt{3}-1)}{(\sqrt{5})^2 - (1)^2 + (\sqrt{3})^2 - (1)^2} \\
 &= \frac{1}{\sqrt{5}-\sqrt{3}} \\
 &= \frac{8(\sqrt{5}+1) + 4(\sqrt{3}-1)}{4 + 2} \\
 &= \frac{1}{\sqrt{5}-\sqrt{3}} \\
 &= \frac{2\sqrt{5} + 2 + 2\sqrt{3} - 2}{\sqrt{5}-\sqrt{3}} = 2(\sqrt{5} + \sqrt{3}) \cdot (\sqrt{5} - \sqrt{3}) \\
 &= 2 \cdot (\sqrt{5})^2 - (\sqrt{3})^2 \\
 &= 2 \cdot (5 - 3) \\
 &= 2 \cdot 2 = 4 \text{ bulunur.}
 \end{aligned}$$

Cevap: E

$$\begin{aligned}
 7. \quad \sqrt{a+1} - \sqrt{25a+25} + 3\sqrt{49a+49} &= 34 \\
 \sqrt{a+1} - \sqrt{25(a+1)} + 3\sqrt{49(a+1)} &= 34 \\
 \sqrt{a+1} - 5\sqrt{a+1} + 21\sqrt{a+1} &= 34 \\
 17\sqrt{a+1} &= 34 \\
 (\sqrt{a+1})^2 &= (2)^2 \\
 a+1 = 4 &\Rightarrow a = 3 \text{ bulunur.}
 \end{aligned}$$

Cevap: C

$$8. \frac{\sqrt{0,09} - \sqrt{0,04}}{\sqrt{0,09} + 0,04} = \frac{\sqrt{\frac{9}{100}} - \sqrt{\frac{4}{100}}}{\sqrt{\frac{9}{100}} + \frac{4}{100}}$$

$$\frac{\frac{3}{10} - \frac{2}{10}}{\frac{3}{10} + \frac{4}{100}} = \frac{\frac{1}{10}}{\frac{34}{100}} = \frac{1}{10} \cdot \frac{100}{34}$$

$$= \frac{5}{17}$$

Cevap: C

$$9. 3^{x+1} = 2 \Rightarrow 3^x \cdot 3 = 2$$

$$9^{x+2} = ? \quad 3^x = \frac{2}{3}$$

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

$$= (3^x)^2 \cdot 3^4$$

$$= \left(\frac{2}{3}\right)^2 \cdot 3^4 = \frac{4}{3^2} \cdot 3^4$$

$$= 4 \cdot 9$$

$$= 36 \text{ bulunur.}$$

Cevap: C

$$10. a, b, c \in \mathbb{Z}^+$$

$$5a + 6b + 4c = 94$$

a'nın en büyük olabilmesi için b ve c'nin en küçük değerleri kullanılır. Katsayısı büyük olana küçük değer kullanılır.

b = 1 ve c = 2 alınır.

$$5a + 6 \cdot 1 + 4 \cdot 2 = 94$$

$$5a + 6 + 8 = 94$$

$$5a = 94 - 14$$

$$5a = 80$$

$$a = 16 \text{ bulunur.}$$

Cevap: B

$$11. \frac{1080 - 1077}{3} + \frac{1075 - 1072}{3} + \dots + \frac{25 - 22}{3} = x$$

O halde

$$\left(\frac{1080 - 25}{5} + 1\right) \cdot 3 = x$$

$$212 \cdot 3 = x$$

$$636 = x \text{ bulunur.}$$

Cevap: D

$$12. a \cdot b = 15$$

$$b \cdot c = 18$$

$$\frac{2}{5}b \left(\frac{10}{3}a + \frac{15}{4}c\right) = \frac{2}{5} \cdot b \cdot \frac{10}{3} \cdot a + \frac{2}{5} \cdot b \cdot \frac{15}{4} \cdot c$$

$$= \frac{4}{3} \cdot b \cdot a + \frac{3}{2} \cdot b \cdot c$$

$$= \frac{4}{3} \cdot 15 + \frac{3}{2} \cdot 18$$

$$= 20 + 27 = 47 \text{ bulunur.}$$

Cevap: C

$$13. \frac{n! + (n+1)!}{(n+2)!} = \frac{1}{9}$$

$$\frac{n! + (n+1) \cdot n!}{(n+2) \cdot (n+1) \cdot n!} = \frac{1}{9}$$

$$\frac{n!(n+2)}{(n+2) \cdot (n+1) \cdot n!} = \frac{1}{9}$$

$$\frac{1}{n+1} = \frac{1}{9}$$

$$n+1 = 9$$

$$n = 8 \text{ bulunur.}$$

Cevap: D

$$14. x^{1007} < 0 \text{ ya } x < 0$$

$$\underbrace{|x|}_{-} + \underbrace{|5-x|}_{+} + \underbrace{|6-x|}_{+} + \underbrace{|7-x|}_{+} + \underbrace{|x-9|}_{-} = 1007$$

$$-x + 5 - x + 6 - x + 7 - x - x + 9 = 1007$$

$$-5x + 27 = 1007$$

$$-5x = 1007 - 27$$

$$-5x = 980$$

$$x = -196$$

Cevap: C

$$15. x < \frac{4}{3}$$

$$|4 - 3x| - \sqrt{9x^2 - 24x + 16} + 3x + 2 = 4$$

$$|4 - 3x| - \sqrt{(3x - 4)^2} + 3x + 2 = 4$$

$$\underbrace{|4 - 3x|}_{+} - \underbrace{|3x - 4|}_{-} + 3x + 2 = 4$$

$$4 - 3x + 3x - 4 + 3x + 2 = 4$$

$$3x = 2$$

$$x = \frac{2}{3} \text{ bulunur.}$$

Cevap: E

$$\begin{aligned}
 16. \quad x - \frac{3}{y} = 4 &\Rightarrow & x \cdot y - 3 &= 4y \\
 & & x \cdot y &= 4y + 3 \\
 y + \frac{9}{x} = 4 & & x \cdot y + 9 &= 4x \\
 & & x \cdot y &= 4x - 9 \\
 4y + 3 &= 4x - 9 \\
 3 + 9 &= 4x - 4y \\
 12 &= 4(x - y) \\
 3 &= x - y
 \end{aligned}$$

Cevap: D

$$\begin{aligned}
 17. \quad & \frac{1}{x} + \frac{2}{y} = \frac{11}{2} \\
 -2/ & \frac{3}{x} + \frac{1}{y} = 24 \\
 \hline
 & \frac{1}{x} + \frac{2}{y} = \frac{11}{2} \\
 + & \frac{-6}{x} - \frac{2}{y} = -48 \\
 \hline
 & \frac{-5}{x} = \frac{-85}{2} \\
 & x = \frac{17}{2} \\
 \frac{17}{2} + \frac{2}{y} &= \frac{11}{2} \Rightarrow \frac{2}{y} = \frac{11}{2} - \frac{17}{2} = \frac{-6}{2} \\
 & \frac{1}{y} = \frac{-3}{2} \\
 \frac{1}{x} + \frac{1}{y} &= \frac{17}{2} - \frac{3}{2} = \frac{14}{2} = 7
 \end{aligned}$$

Cevap: C

$$\begin{aligned}
 18. \quad A - B &= 597 \\
 A &= 23B + 3 \\
 A - 23B &= 3 \\
 A - B &= 597 \\
 -/ \quad A - 23B &= 3 \\
 \hline
 A - B &= 597 \\
 + \quad -A + 23B &= -3 \\
 \hline
 22B &= 594 \\
 B &= 27 \text{ bulunur.}
 \end{aligned}$$

Cevap: E

$$\begin{aligned}
 19. \quad \left(x - \frac{1}{x}\right)^2 &= (5)^2 \Rightarrow x^2 + \frac{1}{x^2} - 2 = 25 \\
 & & x^2 + \frac{1}{x^2} &= 27 \\
 5x^2 + \frac{5}{x^2} &= 5\left(x^2 + \frac{1}{x^2}\right) = 5 \cdot 27 \\
 & & &= 135 \text{ bulunur.}
 \end{aligned}$$

Cevap: E

$$\begin{aligned}
 20. \quad 2x^2 - 7x + 2 &= 0 \\
 2x^2 - 7x &= -2 \\
 x(2x - 7) &= -2 \\
 2x - 7 &= \frac{-2}{x} \\
 \left(2x + \frac{2}{x}\right)^2 &= (7)^2 \\
 4x^2 + 2 \cdot 2x \cdot \frac{2}{x} + \frac{4}{x^2} &= 49 \\
 4x^2 + \frac{4}{x^2} + 8 &= 49 \\
 4x^2 + \frac{4}{x^2} &= 41 \text{ bulunur.}
 \end{aligned}$$

Cevap: D

$$\begin{aligned}
 21. \quad \frac{(a-b)^2 + ab}{4(a^3 + b^3)} \\
 &= \frac{a^2 - 2ab + b^2 + ab}{4((a+b)(a^2 - ab + b^2))} \\
 &= \frac{a^2 - \cancel{ab} + b^2}{4((a+b)(a^2 - \cancel{ab} + b^2))} \\
 &= \frac{1}{4 \cdot \frac{1}{16}} = 4 \text{ bulunur.}
 \end{aligned}$$

Cevap: D

$$\begin{aligned}
22. \quad & \frac{(x^2-1)^2}{1-x-x^2+x^3} \\
&= \frac{(x-1)^2 \cdot (x+1)^2}{(1-x)-x^2(1-x)} \\
&= \frac{(x-1)^2 \cdot (x+1)^2}{(1-x) \cdot (1-x^2)} = \frac{\cancel{(x-1)^2} \cdot (x+1)^2}{(1-x) \cdot (1-x) \cdot (1+x)} \\
&= x+1
\end{aligned}$$

Cevap: B

$$\begin{aligned}
23. \quad & \left(\frac{4x^a}{x^{b+1}}\right)^2 \cdot \left(\frac{x^b}{2x^{a-1}}\right)^2 \\
&= \frac{16x^{2a}}{x^{2b} \cdot x^2} \cdot \frac{x^{2b}}{4x^{2a} \cdot x^{-2}} \\
&= 4 \text{ bulunur.}
\end{aligned}$$

Cevap: B

$$\begin{aligned}
24. \quad & (301)_4 = (122)_4 + (1ab)_4 \\
& \begin{array}{r} (301)_4 \\ - (122)_4 \\ \hline (113)_4 \end{array} \\
& (113)_4 = (1ab)_4 \\
& a=1 \quad b=3 \\
& a-1 = 1-3 = -2 \text{ bulunur.}
\end{aligned}$$

Cevap: A

$$\begin{aligned}
25. \quad & A = \{x \mid |x-2| \leq 4, x \in \mathbb{R}\} \\
& \rightarrow |x-2| \leq 4 \\
& \rightarrow -4 \leq x-2 \leq 4 \\
& \rightarrow \boxed{-2 \leq x \leq 6}
\end{aligned}$$

$$\begin{aligned}
B &= \{x \mid |x+2| < 4, x \in \mathbb{R}\} \\
& \rightarrow |x+2| < 4 \\
& \rightarrow -4 < x+2 < 4 \\
& \rightarrow \boxed{-6 < x < 2}
\end{aligned}$$

$$O \text{ halde } A \cap B = [-2, 2)$$

Cevap: D

$$\begin{aligned}
26. \quad & 2x + 6 < 3y \dots\dots\dots I \\
& 12 - x > 2y \dots\dots\dots II
\end{aligned}$$

I eşitsizliği 2 ile ve II eşitsizliği -3 ile çarpalım

$$\begin{array}{r} 4x + 12 < 6y \\ + \quad -36 + 3x < -6y \\ \hline 7x - 24 < 0 \end{array}$$

$$\begin{array}{l} 7x < 24 \\ \downarrow \\ 3 \\ 2 \\ \vdots \end{array} \left. \vphantom{\begin{array}{l} 7x < 24 \\ \downarrow \\ 3 \\ 2 \\ \vdots \end{array}} \right\} \text{MAX}(x) = 3 \text{ bulunur.}$$

Cevap: C

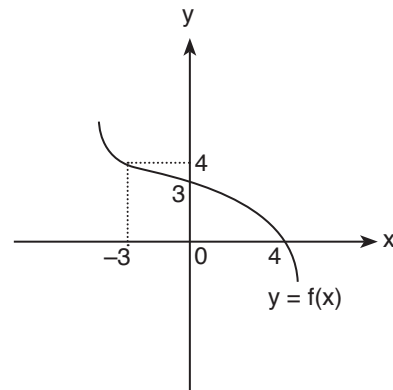
$$27. \quad \left. \begin{array}{l} a+b=2 \\ a+c=3 \end{array} \right\} \text{ için}$$

$$\begin{aligned}
& \Rightarrow a^2 + ab + 2c = ? \\
& \Rightarrow a \cdot (a+b) + 2c = ? \\
& \Rightarrow a \cdot 2 + 2c = ? \\
& \Rightarrow 2 \cdot (a+c) \Rightarrow 2 \cdot 3 = ?
\end{aligned}$$

$$\boxed{6 = ?}$$

Cevap: E

28.



$$\begin{aligned}
f(-3) &= 4 \\
f(4) &= 0 \\
f(0) &= 3
\end{aligned}$$

$$\begin{aligned}
& \Rightarrow (f \circ f \circ f)(-3) \\
& \Rightarrow f[f(f(-3))] = f[f(4)] \\
& = f(0) = 3 \text{ bulunur.}
\end{aligned}$$

Cevap: D

29. $\left\{ \left| x^2 + 1 \right| \right\}^2 \leq \left\{ \left| x + 1 \right| \right\}^2$ her iki tarafın karesini alalım.

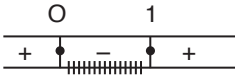
$$\Rightarrow x^4 + 2x^2 + 1 \leq x^2 + 2x + 1$$

$$\Rightarrow x^4 + x^2 - 2x \leq 0 \Rightarrow x \cdot (x^3 + x - 2) \leq 0$$

$$\boxed{x=0} \text{ ve } x^3 + x - 2 = 0$$

$$\boxed{x=1}$$

denklemin kökleridir.



$$\boxed{SS = [0, 1]}$$

Cevap: C

30. $a \in \mathbb{N}$ için

$$\begin{array}{r|l} 5x^2 + 14x - 1 & x + a \\ \hline - & \dots \\ \hline & 2 \end{array} \left\{ \begin{array}{l} x = -a \text{ için;} \\ 5a^2 - 14a - 1 = 2 \\ 5a^2 - 14a - 3 = 0 \\ 5a \quad +1 \\ a \quad -3 \end{array} \right.$$

$$\Rightarrow (5a + 1) \cdot (a - 3) = 0$$

$$a = -\frac{1}{5} \notin \mathbb{N} \text{ ve } a = 3 \in \mathbb{N}$$

Cevap: D

$$31. \quad \begin{array}{r|l} Q(x) & x - 2 \\ \hline & 8 \end{array}$$

$$x = 2 \text{ için}$$

$$\boxed{Q(2) = 8}$$

$$\begin{array}{r|l} P(x) & x - 5 \\ \hline & ? \end{array}$$

$$x = 5 \text{ için}$$

$$\boxed{P(5) = ?}$$

$$\Rightarrow \frac{P(2x+1)}{Q(x)} = x^2 + x + 1 \text{ polinomunda } x = 2 \text{ için;}$$

$$\frac{P(5)}{Q(2)} = 2^2 + 2 + 1 \rightarrow \frac{P(5)}{Q(2)} = 7$$

$$\frac{P(5)}{8} = 7 \Rightarrow \boxed{P(5) = 56}$$

Cevap: E

32. $f(x) = x + \frac{3}{4} - 4$ ve $f(x_1) = f(x_2) = 0$

$$\Rightarrow f(x) = \frac{x^2 + 3 - 4x}{x} = 0$$

$$f(x) = x^2 - 4x + 3 = 0$$

$$\text{kökler toplamı} \Rightarrow x_1 + x_2 = -\frac{b}{a}$$

$$x_1 + x_2 = -\frac{(-4)}{1} = 4 \text{ olur..}$$

Cevap: E

33. $m > 0$ için $m - \frac{20}{m} = 1$ için;

$$\Rightarrow \frac{m^2 - 20}{m} = \frac{1}{1}$$

$$\Rightarrow m^2 - 20 = m \rightarrow m^2 - m - 20 = 0$$

$$m \quad -5$$

$$m \quad +4$$

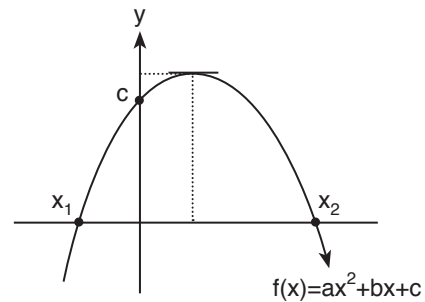
$$\Rightarrow (m - 5) \cdot (m + 4) = 0 \text{ ise;}$$

$$m = 5 \text{ ve } m = -4 \text{ olur } m > 0 \text{ ise}$$

$$\boxed{m = 5} \text{ alınır.}$$

Cevap: D

34.



$x = 0$ için

$f(x) = y = c \Rightarrow$ Pozitif

$x_1 \cdot x_2 =$ negatif $r > 0$

$\frac{c}{a} < 0$

$c \Rightarrow +$

$a \Rightarrow -$

$x_1 + x_2 > 0$

$-\frac{b}{a} > 0$

$b = +$

Cevap: C

$$35. a_n = \begin{cases} 3n-1, & n \equiv 0 \pmod{3} \\ 2, & n \equiv 1 \pmod{3} \\ 2n, & n \equiv 2 \pmod{3} \end{cases}$$

$\Rightarrow n = 6$ için $6 \equiv 0 \pmod{3}$ olur.

o halde; $3 \cdot 6 - 1 = 17 = a_6$

$\Rightarrow n = 8$ için $8 \equiv 2 \pmod{3}$ olur.

o halde; $2 \cdot 8 = 16 = a_8$

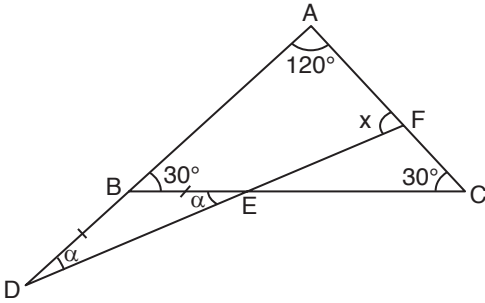
$\Rightarrow n = 28$ için $28 \equiv 1 \pmod{3}$

$a_{28} = 2$

$$\left. \begin{array}{l} a_6 + a_8 + a_{28} = ? \\ = 17 + 16 + 2 \\ = 35 \text{ bulunur.} \end{array} \right\}$$

Cevap: C

36.



$m(\widehat{BAC}) = 120^\circ$ ve $|AB| = |AC|$ ise

$m(\widehat{ABC}) = m(\widehat{ACB}) = 30^\circ$ dir.

$|DB| = |BE|$ olduğundan

$m(\widehat{D}) = m(\widehat{E}) = \alpha$ olsun

$2\alpha = 30^\circ \Rightarrow \alpha = 15^\circ$ olur.

ADF üçgeninde iç açılarının toplamı

$120^\circ + \alpha + x = 180^\circ$

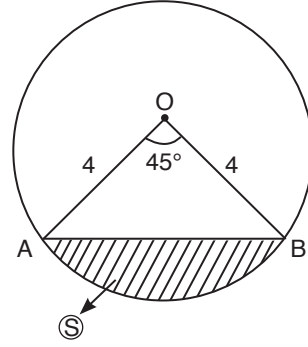
$120 + 15 + x = 180$

$x = 180 - 135$

$x = 45^\circ$ bulunur.

Cevap: D

37.



Merkezi 45° olan daire diliminin alanını bulalım.

$$\frac{45}{360} \cdot \pi \cdot 4^2 = \frac{45}{360} \pi \cdot 16 = 2\pi \text{ olur.}$$

Sonra $A(\widehat{AOB})$ yi bulalım

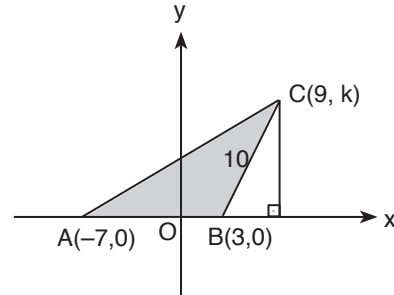
$$\frac{1}{2} \cdot 4 \cdot 4 \cdot \sin 45 = \frac{1}{2} \cdot 4 \cdot 4 \cdot \frac{\sqrt{2}}{2} = 4\sqrt{2}$$

O halde $S = 2\pi - 4\sqrt{2}$ olur.

Cevap: B

TASARI EĞİTİM YAYINLARI

38.



$|AB| = 10 = |BC|$ olur.

C'den x eksenine yükseklik indirelim.

$|OH| = 9$ olup $|BH| = 6$ olur.

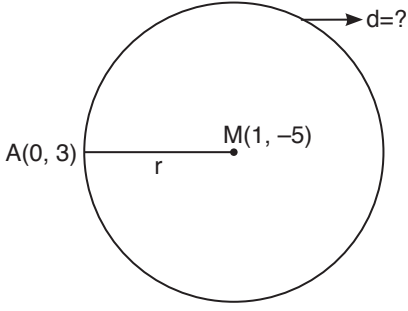
6 - 8 - 10 üçgeninden $|CH| = 8$ olur.

O halde $A(ABC) = \frac{|CH| \cdot |AB|}{2}$

$$= \frac{8 \cdot 10}{2} = 40 \text{ olur.}$$

Cevap: C

39.



M merkezi $m(x_0, y_0)$ ve yarıçapı r olan daire denklemini

$$(x - x_0)^2 + (y - y_0)^2 = r^2 \text{ olur.}$$

$$r = \sqrt{(0 - 1)^2 + (3 - (-5))^2} = \sqrt{1 + 64} = \sqrt{65} \text{ olur.}$$

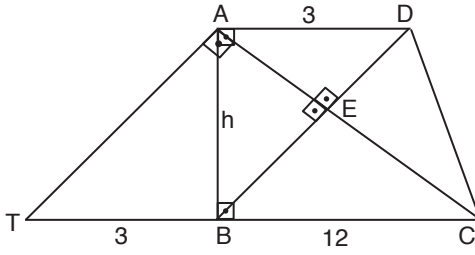
$$(x - 1)^2 + (y + 5)^2 = (\sqrt{65})^2$$

$$x^2 - 2x + 1 + y^2 + 10y + 25 = 65$$

$$x^2 + y^2 - 2x + 10y - 39 = 0$$

Cevap: D

40.



AT ve TB çizilirse $m(\widehat{TAC}) = 90^\circ$ olur.

O halde TAC üçgeninde öklid yapalım

$$h^2 = 3 \cdot 12 \Rightarrow h = \sqrt{36} = 6 \text{ olur.}$$

$$\text{Yamuğun alanı } \frac{(3 + 12) \cdot h}{2} = \frac{15 \cdot 6}{2}$$

$$= 45 \text{ olur.}$$

Cevap: B