

## ÇÖZÜMLER

$$1. \frac{3 - 2 \cdot \frac{5}{3} - 5}{\frac{-2 - \frac{2}{3}}{3}} = \frac{-2 - \frac{10}{3}}{\frac{-8}{9}}$$

$$= \frac{-\frac{16}{3} - \frac{3}{3}}{\frac{-8}{9}} = 6$$

Cevap: C

$$2. a = \frac{b^2 + 180}{b^2}$$

$$a = \frac{b^2}{b^2} + \frac{180}{b^2}$$

$$a = 1 + \frac{180}{b^2}$$

b = 6 için

$$a = 1 + \frac{180}{36} = 1 + 5 = 6$$

Cevap: A

$$3. m = 1,2020... = 1,\overline{20} = \frac{120 - 1}{99} = \frac{119}{99}$$

$$n = 0,4040... = 0,\overline{40} = \frac{40 - 0}{99} = \frac{40}{99}$$

$$\frac{m + 1}{n} = \frac{\frac{119}{99} + 1}{\frac{40}{99}} = \frac{\frac{218}{99}}{\frac{40}{99}} = \frac{218}{40}$$

$$= 5,45$$

Cevap: E

$$4. \frac{2x}{2a} = \frac{3y}{3b} = \frac{z}{c} = \frac{3}{4}$$

$$\frac{2x + 3y + z}{2a + 3b + c} = \frac{3}{4}$$

$$\frac{18}{20 + c} = \frac{3}{4} \Rightarrow 24 = 20 + c$$

$$c = 4$$

Cevap: C

$$5. b = \sqrt[6]{27^a} = 27^{\frac{a}{6}} = 3^{3 \cdot \frac{a}{6}}$$

$$b = 3^{\frac{a}{2}} \Rightarrow 3^a = b^2$$

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

$$= (b^2)^2 \cdot 27 = 27b^4$$

Cevap: E

$$6. \begin{array}{r} a \mid c \\ \hline 5 \mid 4 \end{array} \rightarrow a = 4c + 5$$

$$\begin{array}{r} c \mid 6 \\ \hline 4 \mid x \end{array} \rightarrow c = 6x + 4$$

$$\Rightarrow a = 4(6x + 4) + 5$$

$$a = 24x + 21$$

$$12 \quad \boxed{9=y}$$

Cevap: E

$$7. (\sqrt[3]{-1})^2 \cdot \sqrt{(0,09)^{-1}}$$

$$1 \cdot \sqrt{\frac{100}{9}} = 1 \cdot \frac{10}{3} = \frac{10}{3}$$

Cevap: A

$$8. \quad 0 < x < 3 \rightarrow 0 < 2x < 6$$

$$-3 < y < 2 \rightarrow \begin{array}{l} + \\ -6 < -3y < 9 \\ -6 < 2x - 3y < 15 \end{array}$$

Cevap: B

$$9. \quad \frac{x}{x+1} - \frac{1}{1-\frac{1}{x}} = 1$$

$$\frac{x}{x+1} - \frac{1}{\frac{x-1}{x}} = 1$$

$$\frac{x}{x+1} - \frac{x}{x-1} = 1 \Rightarrow \frac{x^2 - x - x^2 - x}{x^2 - 1} = 1$$

$$-2x = x^2 - 1 \Rightarrow x^2 + 2x - 1 = 0$$

$$\Delta = 4 + 4 = 8 \Rightarrow x_1 = \frac{-2 + \sqrt{8}}{2}$$

$$x_1 = -1 + \sqrt{2}$$

$$10. \quad \begin{array}{r} {}^6A \quad {}^5B \quad {}^5C = 0 \\ + \quad {}^5B \quad {}^5A \\ \hline 7 \quad C \quad A \\ 0 \end{array}$$

$$\Rightarrow A + B + C = 6 + 5 = 0 = 11$$

Cevap: E

Cevap: C

$$11. \quad \frac{(-3)^2}{(-3)^4 \cdot \left(\frac{-1}{3}\right)^3} = \frac{9}{81 \cdot \frac{-1}{27}}$$

$$= \frac{9}{-3} = -3$$

Cevap: B

$$12. \quad \frac{1}{x} = 3 - y \Rightarrow 1 = 3x - xy$$

$$\frac{1}{y} = 4 - x \Rightarrow 1 = 4y - xy$$

$$\Rightarrow 3x - xy = 4y - xy$$

$$3x = 4y \Rightarrow \frac{x}{y} = \frac{4}{3}$$

Cevap: D

$$13. \quad 4a^2 + b^2 = 37$$

$$a = 3 \text{ ve } b = 1 \text{ için}$$

$$4 \cdot 3^2 + 1^2 = 37$$

$$\Rightarrow a + b = 3 + 1 = 4$$

Cevap: B

$$14. \quad \frac{a^{2x} + 4a^2 - 5}{a^{2x} - a^x}$$

$$\frac{(a^x + 5)(a^x - 1)}{a^x(a^x - 1)} = \frac{a^x + 5}{a^x}$$

Cevap: A

$$15. \quad \frac{x^2 - xy + y^2}{x^4 - x^2y^2} \cdot \frac{(x^2 + xy)^3}{x^4 + xy^3}$$

$$\frac{(x^2 - xy + yz)}{x^2(x-y)(x+y)} \cdot \frac{x^3(x+y)^3}{x(x^3 + y^3)}$$

$$\frac{(x^2 - xy + y^2)}{x^2(x-y)(x+y)} \cdot \frac{x^{3+x+y}(x+y)^3}{x \cdot (x+y)(x^2 - xy + y^2)}$$

$$= \frac{x+y}{x-y}$$

Cevap: B

$$16. \frac{1}{x_1^3} + \frac{1}{x_2^3} = \frac{x_1^3 + x_2^3}{(x_1 \cdot x_2)^3}$$

$$= \frac{(x_1 + x_2)(x_1^2 - x_1 x_2 + x_2^2)}{(x_1 x_2)^3}$$

$$= \frac{5 \cdot (x_1^2 + x_2^2 - 5)}{5^3} \quad \left( \begin{array}{l} x_1 + x_2 = 5 \\ x_1^2 + x_2^2 + 2x_1 \cdot x_2 = 25 \\ x_1^2 + x_2^2 = 15 \end{array} \right)$$

$$5 \cdot \frac{15 - 3}{5^3} = \frac{5 \cdot 10}{5^3} = \frac{10}{25} = \frac{2}{5}$$

Cevap: B

$$17. \frac{n! + (n-1)!}{n! - (n-1)!} = \frac{4}{3}$$

$$\frac{(n-1)!(n+1)}{(n-1)!(n-1)} = \frac{4}{3}$$

$$3n + 3 = 4n - 4$$

$$7 = n$$

Cevap: C

$$18. 18^{18} \equiv x \pmod{8}$$

$$2^{18} \equiv x \pmod{8}$$

$$2^3 \cdot 2^{15} = x \pmod{8}$$

$$8 \cdot 2^{15} \equiv x \pmod{8}$$

$$\Rightarrow x = 0$$

Cevap: E

$$19. |3x - 6| = 6 - 3x$$

$$6 - 3x \geq 0$$

$$6 \geq 3$$

$$x \leq 2$$

Cevap: E

$$20. (f^{-1} \circ g^{-1})(x) = \frac{x-5}{3}$$

$$\Rightarrow \frac{x-5}{3} = 3 \Rightarrow x-5 = 9$$

$$x = 14$$

Cevap: D

$$21. f(x) = 3^{x-1} \Rightarrow f(x) = 3^x \cdot \frac{1}{3} \Rightarrow f(x) \cdot 3 = 3^x$$

$$\Rightarrow f(2x+2) = 3^{2x+2-1} = 3^{2x+1}$$

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

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

$$= 27 \cdot f^2(x)$$

Cevap: E

$$22. x = 2t - 1 \Rightarrow \frac{x+1}{2} = t$$

$$y = t + 5 \Rightarrow y - 5 = t$$

$$\Rightarrow \frac{x+1}{2} = y - 5$$

$$y = \frac{x+1}{2} + 5 \Rightarrow y = \frac{x+11}{2}$$

$$\Rightarrow f^{-1}(x) = 2x - 11$$

Cevap: D

$$23. \frac{30^a + 30^a}{10^a + 10^a + 10^a + 10^a + 10^a + 10^a} = 81$$

$$\frac{2 \cdot 30^a}{6 \cdot 10^a} = 81$$

$$\frac{1}{3} \cdot \left(\frac{30}{10}\right)^a = 81$$

$$\Rightarrow 3^a = 3 \cdot 3^4 = 3^5$$

$$a = 5 \text{ bulunur.}$$

Cevap: D

$$24. P(3) = 9a + 3b + c = 0$$

$$P(2) = -4a + 2b + c = 0$$

$$5a + b = 0 \Rightarrow b = -5a \Rightarrow \frac{b}{a} = -5$$

Cevap: C

$$25. \zeta = \frac{1}{x_1} \cdot \frac{1}{x_2} = \frac{1}{x_1 \cdot x_2} = \frac{1}{4}$$

$$T = \frac{1}{x_1} + \frac{1}{x_2} = \frac{x_1 + x_2}{x_1 \cdot x_2} = \frac{3}{4}$$

$$9(x) = x^2 - Tx + \zeta$$

$$= x^2 - \frac{3}{4}x + \frac{1}{4}$$

$$= 4x^2 - 3x + 1$$

Cevap: D

$$26. a \cdot b = 12$$

$$b \cdot c = 60$$

$$x \quad a \cdot c = 80$$

$$(a \cdot b \cdot c)^2 = 12 \cdot 60 \cdot 80$$

$$(a \cdot b \cdot c)^2 = 12 \cdot 12 \cdot 5 \cdot 5 \cdot 16$$

$$a \cdot b \cdot c = 12 \cdot 5 \cdot 4$$

$$\underline{\quad}$$

$$c = 20 \text{ bulunur.}$$

Cevap: E

$$27. -x / x^3 - 2y = 5$$

$$x^4 - 2xy = 70$$

$$\underline{-x^4 + 2xy = -5x}$$

$$+ \quad x^4 - 2xy = 70$$

$$\underline{\quad} \quad 0 = -5x + 70$$

$$5x = 70$$

$$x = 14 \text{ bulunur.}$$

Cevap: C

$$28. f(x) = a \cdot (x - 1)(x - 3)$$

$$2 = a \cdot (-1) \cdot (-3)$$

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

$$f(x) = \frac{2}{3}(x - 1)(x - 3)$$

$$f(x) = \frac{2x^2}{3} - \frac{8x}{3} + 2$$

$$r = \frac{-b}{2a} = \frac{\frac{8}{3}}{\frac{4}{3}} = 2$$

$$f(r) = k = \frac{2 \cdot 4}{3} - \frac{8 \cdot 2}{3} + 2 = -\frac{8}{3} + 2 = -\frac{2}{3}$$

$$r + k = 2 - \frac{2}{3} = \frac{4}{3}$$

Cevap: A

$$29. \frac{81x^4 + 1}{9x^2} = \frac{81x^4}{9x^2} + \frac{1}{9x^2}$$

$$= 9x^2 + \frac{1}{9x^2} \text{ A olsun}$$

$$\left(3x + \frac{1}{3x}\right)^2 = (8)^2 \text{ (Her iki tarafın karesi alınsın)}$$

$$9x^2 + \frac{1}{9x^2} + 2 \cdot 3x \cdot \frac{1}{3x} = 64$$

$$9x^2 + \frac{1}{9x^2} = 62 \text{ bulunur.}$$

Cevap: E

Cevap: D

$$30. \sum_{k=1}^5 \prod_{n=1}^3 2nk = \sum_{k=1}^5 (2k \cdot 4k \cdot 6k)$$

$$\sum_{k=1}^5 48k^3 = 48(1^3 + 2^3 + 3^3 + 4^3 + 5^3)$$

$$= 48 \cdot (1 + 8 + 27 + 64 + 125)$$

$$= 10800$$

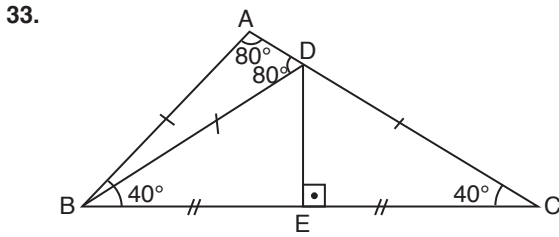
Cevap: E

31.  $\underbrace{3021 - 3020}_{1} + \underbrace{3019 - 3018}_{1} + \dots + \underbrace{3 - 2}_{1} + 1 = ?$   
1510 adet 1 var.

Cevap: B

32.  $(2a)_5 = (1101)_2$   
 $2 \cdot 5^1 + a \cdot 5^0 = 1 \cdot 2^3 + 1 \cdot 2^2 + 0 \cdot 2^1 + 1 \cdot 2^0$   
 $10 + a = 13 \Rightarrow \boxed{a=3}$

Cevap: D



B ile D'yi birleştirelim.

BDC üçgeninde [DE] hem yükseklik hem kenarortay olduğundan BDC ikizkenar üçgen

$$|BD| = |DC| \quad m(\widehat{DBC}) = m(\widehat{DCB}) = 40^\circ$$

BDC üçgeninde iki iç açı toplamı kendisine komşu olmayan dış açıya eşittir.

$$m(\widehat{ADB}) = 40^\circ + 40^\circ = 80^\circ$$

$$|AB| = |BD| \text{ olduğundan } m(\widehat{BAD}) = 80^\circ$$

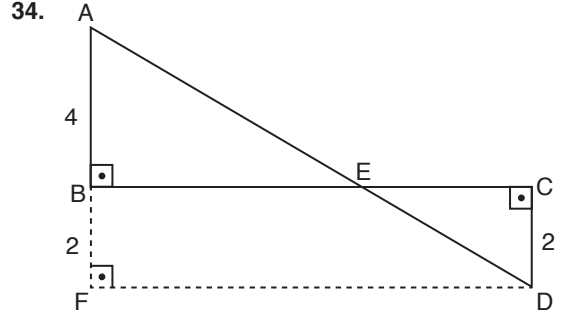
O halde

$$m(\widehat{ABD}) + 80 + 80 = 180$$

$$m(\widehat{ABD}) = 20^\circ$$

$$m(\widehat{ABE}) = x = 20 + 40 = 60^\circ \text{ bulunur.}$$

Cevap: E



AFD dik üçgeninde pisagor teoreminden

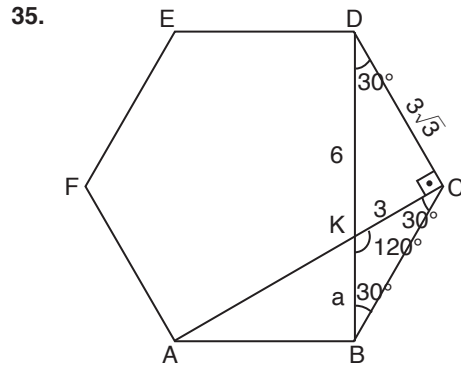
$$6^2 + |FD|^2 = 10^2$$

$$|FD|^2 = 100 - 36 = 64$$

$$|FD| = 8 \text{ cm}$$

$$|BC| = |FD| \text{ olduğundan } |BC| = 8 \text{ cm}$$

Cevap: E



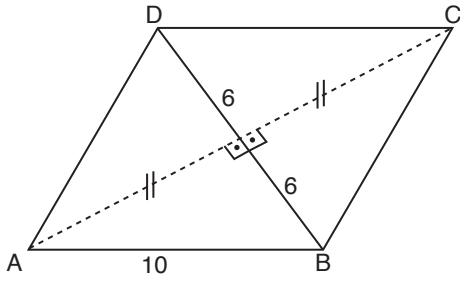
$$\text{DKC üçgeninde } |DK| = 6 \text{ cm} \Rightarrow |KC| = 3 \text{ cm}$$

$$|DC| = 3\sqrt{3} \text{ cm'dir.}$$

$$|KC| = |BK| = a = 3 \text{ cm}$$

Cevap: B

36.



$[AC] \perp [BD]$

$|DO| = |OB| = 6$  br olur.

AOB üçgeninde pisagor teoreminde

$$|AO|^2 + |OB|^2 = |AB|^2$$

$$|AO|^2 + 6^2 = 10^2$$

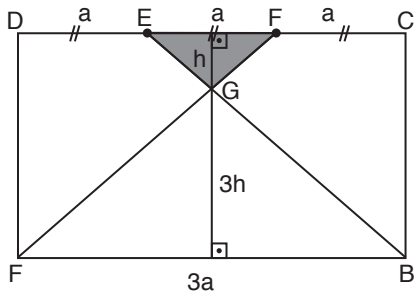
$$|AO|^2 = 100 - 36 = 64$$

$$|AO| = 8 \text{ br}$$

$|AO| = 8 \text{ br} \Rightarrow |AC| = 16 \text{ br'dir.}$

$$A(ABCD) = \frac{|AC| \cdot |BD|}{2} = \frac{16 \cdot 12}{2} = 96 \text{ br}^2$$

37.



EFG üçgeni ile AGB üçgeni benzerdir. Benzerlik oranı 3'tür. Buna göre [EF]'ye ait yükseklik h ise [AB] ait yükseklik  $3h$ 'tir.

$$A(EGF) = \frac{a \cdot h}{2}$$

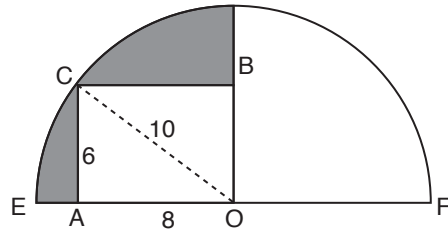
$$3 = \frac{a \cdot h}{2} \Rightarrow a \cdot h = 6 \text{ cm}^2$$

$$A(ABCD) = 3a \cdot 4h$$

$$= 12 \cdot a \cdot h = 12 \cdot 6 = 72 \text{ cm}^2$$

Cevap: A

38.



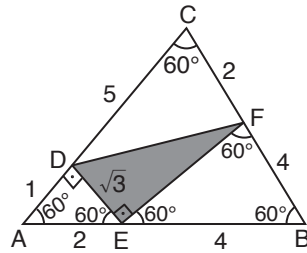
$$10^2 = 6^2 + |OA|^2 \Rightarrow |OA| = 8$$

$$T.A = \frac{1}{4} \pi \cdot 10^2 - 6 \cdot 8$$

$$= 25\pi - 48 \text{ cm}$$

Cevap: B

39.



ADE üçgeninde 30, 60, 90 üçgeni

$|AD| = 1 \text{ br}$   $|AE| = 2 \text{ br}$  ve  $|DE| = \sqrt{3} \text{ br}$

$|AC| = 6 \text{ br}$   $|EB| = 4 \text{ br}$  olup

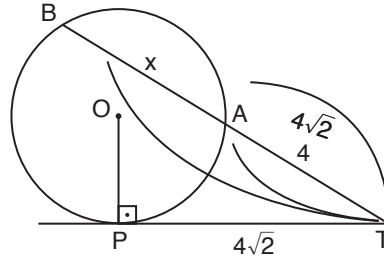
EFB eşkenar üçgen olduğundan  $|EF| = 4 \text{ br}$  olur.

O halde

$$A(\widehat{DEF}) = \frac{4 \cdot \sqrt{3}}{2} = 2\sqrt{3} \text{ br}^2$$

Cevap: C

40.



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

$$32 = 16 + 4x$$

$$16 = 4x \Rightarrow x = 4$$

Cevap: B