

1.  $(x + 2)^2 = (x - 1)^2 + ax + b$   
parantez kuvvetleri açıp düzenleyelim.  
 $x^2 + 4x + 4 = x^2 - 2x + 1 + ax + b$   
 $4x + 4 = -2x + 1 + ax + b$   
 $4x + 4 = (-2 + a)x + b + 1$   
 $a - 2 = 4$  ve  $b + 1 = 4$   
 $a = 6$  ve  $b = 3$   
 $a \cdot b = 6 \cdot 3 = 18$

**CEVAP: D**

2.  $x^2 + 12x + 41 = x^2 + 12x + 36 + 5$   
 $= (x+6)^2 + 5$  ifadesi  $x = -6$   
için en küçük değerini alır.  
 $(x+6)^2 + 5 = (-6 + 6)^2 + 5$   
 $= 5$

**CEVAP: B**

3.  $a = \sqrt[3]{4} - 1$   
 $a^3 + 3a^2 + 3a + 7 = a^3 + 3a^2 + 3a + 1 + 6$   
 $= (a + 1)^3 + 6$ ,  $(a + 1 = \sqrt[3]{4})$   
 $= (\sqrt[3]{4})^3 + 6$   
 $= 4 + 6$   
 $= 10$

**CEVAP: D**

4.  $a^2 - 2a = x$  diyelim  
 $(a^2 - 2a)^2 - 11 \cdot (a^2 - 2a) + 24 = x^2 - 11x + 24$   
 $= (x - 8) \cdot (x - 3)$   
 $= (a^2 - 2a - 8) \cdot (a^2 - 2a - 3)$   
 $= (a - 4) \cdot (a + 2) \cdot (a - 3) \cdot (a + 1)$   
Çarpanları olduğundan  $(a - 1)$  çarpanı değildir.

**CEVAP: A**

$$\begin{aligned}
 5. \quad x &= 3\sqrt{2} + 1 \\
 x^2 - 2x + 7 &= x^2 - 2x + 1 + 6 \\
 &= (x - 1)^2 + 6, \quad (x - 1 = 3\sqrt{2}) \\
 &= (3\sqrt{2})^2 + 6 \\
 &= 9 \cdot 2 + 6 \\
 &= 18 + 6 \\
 &= 24
 \end{aligned}$$

CEVAP: D

$$\begin{aligned}
 6. \quad x^3 + y^3 &= 34 \\
 x \cdot y (x + y) &= 10 \Rightarrow x^2 y + xy^2 = 10 \\
 x^3 + y^3 &= 34 \\
 3 / x^2 y + xy^2 &= 10 \\
 x^3 + y^3 &= 34 \\
 + 3x^2 y + 3xy^2 &= 30 \\
 \hline
 x^3 + 3x^2 y + 3xy^2 + y^3 &= 64 \\
 (x+y)^3 &= 64 \\
 x + y &= 4
 \end{aligned}$$

CEVAP: D

$$\begin{aligned}
 7. \quad \sqrt{x \cdot (x+3)(x+4)(x+7) + 36} \\
 = \sqrt{(x^2 + 7x)(x^2 + 7x + 12) + 36} \\
 x^2 + 7x = t \text{ ise} \\
 = \sqrt{t \cdot (t+12) + 36} \\
 = \sqrt{t^2 + 12t + 36} \\
 = \sqrt{(t+6)^2} \\
 = t + 6 \\
 = x^2 + 7x + 6
 \end{aligned}$$

CEVAP: D

$$\begin{aligned}
 8. \quad x^2 - y^2 &= 20 \\
 (x-y)(x+y) &= 20 \text{ dir.} \\
 \begin{array}{cc}
 1 & 20 \\
 2 & 10 \\
 4 & 5
 \end{array}
 \end{aligned}$$

Ancak  $x - y = 1$  iken  $x + y = 20$  ise denklemi sağlayan  $x, y$  pozitif tamsayıları bulunamaz. Aynı şekilde  $x + y = 5$  iken  $x - y = 4$  olamaz. Bu durumda

$$\left. \begin{array}{l}
 x - y = 2 \\
 x + y = 10
 \end{array} \right\} \text{ortak çözüm yapalım.}$$

$$2x = 12$$

$$\left. \begin{array}{l}
 x = 6 \\
 y = 4
 \end{array} \right\} x^2 + y^2 = 6^2 + 4^2 = 36 + 16 = 52 \text{ dir.}$$

CEVAP: D

$$\begin{aligned}
 9. \quad & \text{9 ekleyip çıkaralım} \\
 a^3 - 6a^2 + 12a + 1 + 9 - 9 \\
 = a^3 - 6a^2 + 12a - 8 + 9 \\
 = (a-2)^3 + 9 \\
 = (\sqrt[3]{5} - 2)^3 + 9 \\
 = (\sqrt[3]{5})^3 + 9 \\
 = 5 + 9 \\
 = 14
 \end{aligned}$$

CEVAP: E



$$10. \frac{1}{x} - \frac{1}{y} = 1 \Rightarrow \frac{y-x}{xy} = 1 \Rightarrow y-x = xy$$

$$x^2 + y^2 = 35$$

$$y-x = xy, \text{ (iki tarafın karesini alalım)}$$

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

$$y^2 - 2xy + x^2 = x^2 y^2, \text{ (} x^2 + y^2 = 35 \text{)}$$

$$35 - 2xy = x^2 y^2, \text{ (} x \cdot y = a \text{ diyelim)}$$

$$35 - 2a = a^2$$

$$a^2 + 2a - 35 = 0$$

$$a \quad -5$$

$$a \quad +7$$

$$(a-5)(a+7) = 0$$

$$a-5 = 0$$

$$a+7 = 0$$

$$a = 5$$

$$a = 7$$

$$xy = 5$$

$$x \cdot y = -7$$

(x ve y pozitif sayılar olduğundan

$x \cdot y = -7$  olmaz)

**CEVAP: B**

$$11. 2^x = a \text{ ve } 2^y = b \text{ diyelim}$$

$$\frac{\sqrt{4^x + 2^{x+y+1} + 4^y}}{2^x} = 17$$

$$\frac{\sqrt{(2^x)^2 + 2 \cdot 2^x \cdot 2^y + (2^y)^2}}{2^x} = 17$$

$$\frac{\sqrt{a^2 + 2ab + b^2}}{a} = 17$$

$$\frac{\sqrt{(a+b)^2}}{a} = 17$$

$$\frac{a+b}{a} = 17$$

$$\frac{a}{a} + \frac{b}{a} = 17$$

$$\frac{b}{a} = 16$$

$$\frac{2^y}{2^x} = 16$$

$$2^{y-x} = 2^4 \Rightarrow y-x = 4$$

$$x-y = -4$$

**CEVAP: A**

$$12. \begin{array}{l} a-b=6 \\ b-c=6 \end{array} \Rightarrow \begin{array}{l} a-b=6 \\ + b-c=6 \\ \hline a-c=12 \end{array}$$

$$a^2 + c^2 - 2b^2 = a^2 - b^2 + c^2 - b^2$$

$$= (a-b)(a+b) + (c-b) \cdot (c+b), \left( \begin{array}{l} a-b=6 \\ c-b=-6 \end{array} \right)$$

$$= 6 \cdot (a+b) + (-6) \cdot (c+b)$$

$$= 6(a+b) - 6(c+b)$$

$$= 6a + 6b - 6c - 6b$$

$$= 6(a-c), \text{ (} a-c = 12 \text{)}$$

$$= 6 \cdot 12$$

$$= 72$$

**CEVAP: D**

$$13. 2^x = a \text{ diyelim}$$

$$4^x - 9 \cdot 2^x + 8 = 0$$

$$(2^x)^2 - 9 \cdot 2^x + 8 = 0, \text{ (} 2^x = a \text{)}$$

$$a^2 - 9a + 8 = 0$$

$$a \quad -8$$

$$a \quad -1$$

$$(a-8)(a-1) = 0$$

$$a-8 = 0 \text{ veya } a-1 = 0$$

$$a = 8, \text{ } a = 1$$

$$2^x = 2^3 \Rightarrow x = 3$$

$$2^x = 2^0 \Rightarrow x = 0$$

x değerlerinin çarpımı 3.0 = 0

**CEVAP: A**



14.  $a^2 + b^2 + b^2 + 2ab - 10b + 25 = 0$

$$\underline{a^2 + 2ab + b^2} + b^2 - 10b + 25 = 0$$

$$(a + b)^2 + (b - 5)^2 = 0$$

$$a + b = 0 \quad \text{ve} \quad b - 5 = 0$$

$$a = -b \quad \text{ve} \quad b = 5$$

$$a = -5$$

Buna göre

$$a \cdot b = -5 \cdot 5 = -25$$

CEVAP: D

15. İfadenin iki tarafını  $a + 1$  ile çarpalım.

$$(a + 1) \underline{(a - 1)} (a^2 + 1) (a^4 + 1) (a^8 + 1) = a^{15} \cdot (a + 1)$$

$$(a^2 - 1) \underline{(a^2 + 1)} (a^4 + 1) (a^8 + 1) = a^{16} + a^{15}$$

$$(a^4 - 1) \underline{(a^4 + 1)} (a^8 + 1) = a^{16} + a^{15}$$

$$(a^8 - 1) \underline{(a^8 + 1)} = a^{16} + a^{15}$$

$$\cancel{a^{16}} - 1 = \cancel{a^{16}} + a^{15}$$

$$a^{15} = -1$$

CEVAP: D

16. Taraf tarafa çarpalım

$$\sqrt{a+5} + \sqrt{a} = \frac{5}{2}$$

$$\sqrt{a+5} - \sqrt{a} = \text{istenen}$$

$$(\sqrt{a+5} + \sqrt{a}) \cdot (\sqrt{a+5} - \sqrt{a}) = \frac{5}{2} \text{ istenen}$$

$$(\sqrt{a+5})^2 - (\sqrt{a})^2 = \frac{5}{2} \text{ istenen}$$

$$\cancel{a} + 5 - \cancel{a} = \frac{5}{2} \text{ istenen}$$

$$\cancel{a} = \frac{5}{2} \text{ istenen}$$

$$2 = \text{istenen}$$

CEVAP: E

17.  $4^{4x^2 + 12x + 10} = 4^{4x^2 + 12x + 9} + 1$

$$= 4^{(2x+3)^2 + 1}$$

$$= 4^{(2x+3)^2 + 1} \text{ ifadesi } x = \frac{-3}{2} \text{ için en küçük değerini alır.}$$

$$= 4^{(2x+3)^2 + 1} = 4^{(2x+3)^2 + 1}, \left(x = \frac{-3}{2}\right)$$

$$= 4^{0^2 + 1}$$

$$= 4^1$$

$$= 4$$

CEVAP: C



$$\begin{aligned}18. \quad x^2 + y^2 + 6y - 4x + 13 &= 0 \\ x^2 - 4x + y^2 + 6y + 13 &= 0 \\ x^2 - 4x + y^2 + 6y + 4 + 9 &= 0 \\ x^2 - 4x + 4 + y^2 + 6y + 9 &= 0 \\ (x - 2)^2 + (y + 3)^2 &= 0\end{aligned}$$

$$\begin{aligned}x - 2 = 0 \quad \text{ve} \quad y + 3 = 0 &\text{ olmalıdır.} \\ x = 2 \quad \quad \quad y = -3\end{aligned}$$

$$\begin{aligned}x + y &= 2 - 3 \\ &= -1\end{aligned}$$

**CEVAP: C**

$$\begin{aligned}19. \quad x - \frac{1}{x} = 3 &\Rightarrow \left(x - \frac{1}{x}\right)^2 = 3^2 \\ x^2 - 2 + \frac{1}{x^2} &= 9 \\ x^2 + \frac{1}{x^2} &= 11\end{aligned}$$

$$\begin{aligned}x^3 - \frac{1}{x^3} &= \left(x - \frac{1}{x}\right) \cdot \left(x^2 + 1 + \frac{1}{x^2}\right), \left(x - \frac{1}{x} = 3\right), \left(x^2 + \frac{1}{x^2} = 11\right) \\ &= 3 \cdot (11 + 1) \\ &= 3 \cdot 12 \\ &= 36\end{aligned}$$

**CEVAP: E**

$$20. \quad x + \frac{1}{x+1} = 4 \Rightarrow x + 1 + \frac{1}{x+1} = 5$$

$$x + 1 + \frac{1}{x+1} = 5, \text{ (iki tarafın karesini alalım)}$$

$$\left(x + 1 + \frac{1}{x+1}\right)^2 = 5^2$$

$$(x+1)^2 + 2 \cdot (x+1) \cdot \frac{1}{x+1} + \left(\frac{1}{x+1}\right)^2 = 25$$

$$x^2 + 2x + 1 + 2 + \frac{1}{x^2 + 2x + 1} = 25$$

$$x^2 + 2x + 1 + \frac{1}{x^2 + 2x + 1} = 23$$

**CEVAP: B**