

TEST 3

Çarpanlara Ayırma

1. $x^2 + y^2 - 4x + 4y + 8 = 0$

$$= \underbrace{x^2 - 4x + 4} + \underbrace{y^2 + 4y + 4} = 0$$

$$= (x - 2)^2 + (y + 2)^2 = 0$$

$$x - 2 = 0 \quad y + 2 = 0$$

$$x = 2 \quad y = -2$$

$$x + y = 2 - 2 = 0$$

Cevap: A

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

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

$$\left(x - \frac{1}{x}\right)^2 = (2\sqrt{15})^2 = \left(x + \frac{1}{x}\right)^2 - 4$$

$$= 60 = \left(x + \frac{1}{x}\right)^2 - 4$$

$$\Rightarrow 64 = \left(x + \frac{1}{x}\right)^2$$

$$\Rightarrow x + \frac{1}{x} = 8$$

Cevap: C

3. $\frac{a+1}{\frac{1}{a^2} + \frac{2a}{a^2} + \frac{a^2}{a^2}} + \frac{a}{a+1} =$

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

$$= \frac{(a+1) \cdot a^2}{(a+1)^2} + \frac{a}{a+1} = \frac{a^2}{a+1} + \frac{a}{a+1}$$

$$= \frac{a^2 + a}{a+1} = \frac{a(a+1)}{a+1} = a$$

Cevap: C

4. $\sqrt{(100+1)(100-1)+1} =$

$$= \sqrt{100^2 - 1^2 + 1} = 100$$

Cevap: A

5. $75^2 - 74^2 = (75 - 74)(75 + 74)$
 $= 1 \cdot 149 = 149$

Cevap: D

$$6. \frac{(x-2)(x+1)}{x^2 - ax - 6}$$

$x-2$ çarpanı $x^2 - ax - 6$ ifadesinin bir çarpanı olsun;

$$x^2 - ax - 6$$

$$-a = -2 + 3 \Rightarrow a = -1$$

$x+1$ çarpanı, $x^2 - ax - 6$ ifadesinin bir çarpanı olsun;

$$x^2 - ax - 6$$

$$-a = +1 - 6 \Rightarrow a = 5$$

$a = -1, 5$ değerlerini alır.

$$-1 + 5 = 4 \text{ olur.}$$

Cevap: A

$$7. x^2 - 5 = (x-5)(x+5)$$

Cevap: C

$$8. \frac{(a-b)(a+b) - (a-b)}{a^2 - (b^2 - 2b + 1)} =$$

$$= \frac{(a-b)(a+b-1)}{a^2 - (b-1)^2} = \frac{(a-b)(a+b-1)}{[a-(b-1)][a+(b-1)]}$$

$$= \frac{(a-b) \cancel{(a+b-1)}}{(a-b+1) \cancel{(a+b-1)}} = \frac{a-b}{a-b+1}$$

$$\Rightarrow \frac{\overbrace{a-b}^1}{\underbrace{a-b+1}_1} = \frac{1}{1+1} = \frac{1}{2}$$

Cevap: B

$$9. \frac{\frac{1+a}{a}}{\frac{1}{a^2} + \frac{2a}{a^2} + \frac{a^2}{a^2}} : \frac{a}{a^2-1} =$$

$$= \frac{\frac{1+a}{a}}{\frac{a^2+2a+1}{a^2}} : \frac{a}{a^2-1}$$

$$= \frac{(a+1)}{a} \cdot \frac{a^2}{(a+1)^2} \cdot \frac{a^2-1}{a}$$

$$= \frac{a^2-1}{a+1} = \frac{(a-1)(a+1)}{a+1} = a-1$$

Cevap: C

$$10. \frac{(x+1)(x^2-x+1)}{(x-1)(x+1)} \cdot \frac{x-1}{x^2-x+1}$$

$$= 1$$

Cevap: D

11. İki kare farkından;

$$[(a+b) - (a-b)] \cdot [(a+b) + (a-b)]$$

$$= 2b \cdot 2a = 4ab$$

Cevap: D

$$\begin{aligned}
12. (2a + 1) [(3a - 1) - (a - 5)] - (2a + 1)^2 \\
&= (2a + 1) \cdot (2a + 4) - (2a + 1)^2 \\
&= (2a + 1) \cdot ((2a + 4) - (2a + 1)) \\
&= (2a + 1) \cdot (3) = 6a + 3
\end{aligned}$$

Cevap: A

$$\begin{aligned}
13. x^2 - 8x + 16 - y^2 - 4y - 4 = \\
&= x^2 - 8x + 16 - (y^2 + 4y + 4) \\
&= (x - 4)^2 - (y + 2)^2 \\
&= [(x - 4) - (y + 2)] [(x - 4) + (y + 2)] \\
&= (x - y - 6) \cdot (x + y - 2)
\end{aligned}$$

Cevap: C

$$14. \frac{(a+2)(a-1)}{(a+2)(a+2)} \cdot \frac{(a-2)(a+2)}{(a-1)(a+1)} = \frac{a-2}{a+1}$$

Cevap: D

$$\begin{aligned}
15. \frac{x^2(x+1) - (x+1)}{(x+1)(x+1)} &= \frac{(x+1)(x^2-1)}{(x+1)(x+1)} \\
\frac{(x+1)(x+1)(x-1)}{(x+1)(x+1)} &= x-1
\end{aligned}$$

Cevap: C

$$\begin{aligned}
16. \frac{(x+y)^2 - 6^2}{(x-y)(x+y) + 6(x-y)} = \\
= \frac{(x+y-6)(x+y+6)}{(x-y)(x+y+6)} = \frac{x+y-6}{x-y}
\end{aligned}$$

Cevap: B

$$\begin{aligned}
17. \frac{16 - (x^2 + 2x + 1)}{(x^2 - 2x - 3)} &= \frac{4^2 - (x+1)^2}{(x-3)(x+1)} \\
&= \frac{[4 - (x+1)] \cdot [4 + (x+1)]}{-1(x-3)(x+1)} \\
&= \frac{(3-x) \cdot (x+5)}{(x-3)(x+1)} = \frac{x+5}{-x-1}
\end{aligned}$$

Cevap: C

$$\begin{aligned}
18. x^2 + (a-1) \cdot x + 5^2 \\
&= (x+5)^2 \text{ olmalıdır.} \\
(a-1) \cdot x &= 2 \cdot x \cdot 5 \\
a-1 &= 10 \\
a &= 11 \text{ olmalıdır.}
\end{aligned}$$

Cevap: D

$$19. \frac{\frac{1-x}{x}}{(1-x)(1+x)} = \frac{1-x}{x} \cdot \frac{x}{(1-x)(1+x)}$$

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

Cevap: C

$$20. \frac{(x-5)(x-3)}{(x-3)(x-2)} : \frac{-(x^2-7x+10)}{x^2-4x+4}$$

$$= \frac{(x-5)(x-3)}{(x-3)(x-2)} : \frac{-(x-5)(x-2)}{(x-2)(x-2)}$$

$$= \frac{\cancel{(x-5)} \cancel{(x-3)}}{\cancel{(x-3)} (x-2)} \cdot \frac{\cancel{(x-2)} \cancel{(x-2)}}{-\cancel{(x-5)} \cancel{(x-2)}}$$

$$= -1$$

Cevap: A