

30 GÜNDE DGS
TEK.
15. GÜN

- *Çarpanlara Ayırma*
- 

$$1. \frac{x^2 - 3x}{4x} \cdot \frac{4x - 12}{(4x)^2} = \frac{x(x-3)}{4x} \cdot \frac{16x^2}{4(x-3)} = x^2$$

Cevap: B

$$2. \frac{xy - ay + 2ab - 2xb}{a - x} = \frac{y(x - a) - 2b(x - a)}{a - x}$$

$$= \frac{(x - a)(y - 2b)}{a - x} = 2b - y$$

Cevap: C

$$3. \frac{b(a - 1) + (a - 1)}{b(a + 1) + (a + 1)} = \frac{(a - 1) \cdot (b + 1)}{(a + 1) \cdot (b + 1)} = \frac{1}{3}$$

$$\frac{a - 1}{a + 1} \cdot \frac{1}{3} \Rightarrow \frac{3a - 3}{3(a + 1)} = \frac{1}{3} \Rightarrow 3a - 3 = a + 1$$

$$2a = 4 \Rightarrow a = 2$$

Cevap: B

$$4. a^2 + ab - ac - bc = a(a + b) - c(a + b)$$

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

$$= 9 \cdot 2 = 18$$

Cevap: C

$$5. \frac{1 + \frac{4}{x}}{1 - \frac{16}{x^2}} = \frac{\frac{x + 4}{x}}{\frac{x^2 - 16}{x^2}} = \frac{x + 4}{x} \cdot \frac{x^2}{x^2 - 16}$$

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

$$= \frac{x}{x - 4}$$

Cevap: D

$$6. \frac{x \cdot y^2 + x^2 \cdot y}{x^2 - y^2} \cdot \frac{x - y}{x \cdot y} = \frac{xy(y + x)}{(x - y)(x + y)} \cdot \frac{x - y}{xy} = 1$$

Cevap: E

$$7. \frac{x + 2y}{x^2 - 4y^2} : \frac{x^3}{x^2 - 2xy} = \frac{x + 2y}{(x + 2y)(x - 2y)} \cdot \frac{x(x - 2y)}{x^3}$$

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

Cevap: A

$$8. \bullet mn + n^2 = 24 \rightarrow n(m + n) = 24$$

$$\bullet m^2 \cdot n - n^3 = 192$$

$$n(m^2 - n^2) = 192$$

$$\frac{n \cdot (m + n)(m - n)}{24} = 192$$

$$m - n = \frac{192 \cdot 24}{n(m + n)} = 8 \text{ olur.}$$

Cevap: C

$$9. \sqrt{x} + \sqrt{y} = 17$$

$$x - y = 17 \Rightarrow (\sqrt{x} + \sqrt{y})(\sqrt{x} - \sqrt{y}) = 17$$

$$\begin{array}{r} \sqrt{x} + \sqrt{y} = 17 \\ + \sqrt{x} - \sqrt{y} = 1 \\ \hline 2\sqrt{x} = 18 \\ \sqrt{x} = 9 \\ x = 81 \end{array}$$

$$\begin{array}{r} \sqrt{x} + \sqrt{y} = 17 \\ \sqrt{x} = 9 \\ \hline \sqrt{y} = 8 \\ y = 64 \end{array}$$

$$x + y = 81 + 64 = 145 \text{ bulunur.}$$

Cevap: E

10. $\boxed{a^2 - b^2 = (a - b)(a + b)}$

$a - b = (\sqrt{a} - \sqrt{b})(\sqrt{a} + \sqrt{b})$ olur.

$$\frac{1}{\sqrt{a} + \sqrt{b}} \cdot \frac{(\sqrt{a} - \sqrt{b})(\sqrt{a} + \sqrt{b})}{\sqrt{a} \cdot \sqrt{b}(\sqrt{a} - \sqrt{b})} = \frac{1}{5}$$

$$\frac{1}{\sqrt{a} \cdot \sqrt{b}} = \frac{1}{5}$$

$$(\sqrt{a} \cdot \sqrt{b})^2 = (5)^2$$

$a \cdot b = 25$ bulunur.

Cevap: E

11. I. adım

$$x^2 = 28 - 6y$$

$$-y^2 = -28 + 6x$$

$$x^2 - y^2 = 6x - 6y$$

$$(x - y)(x + y) = 6(x - y)$$

$$x + y = 6$$

II. adım

$$x^2 = 28 - 6y$$

$$y^2 = 28 - 6x$$

$$x^2 + y^2 = 56 - 6(x + y)$$

$$x^2 + y^2 = 56 - 36$$

$$x^2 + y^2 = 20$$

I. adımdan $(x + y)^2 = 6^2$

$$x^2 + y^2 + 2xy = 36$$

$$\underbrace{\hspace{1cm}}_{20}$$

$$2x \cdot y = 36 - 20$$

$$2x \cdot y = 16$$

$x \cdot y = 8$ olur.

Cevap: B

12. $\frac{(p+m)^2 - q^2}{(q+m)^2 - p^2} = \frac{(\cancel{p+m+q}) \cdot (p+m-q)}{(\cancel{q+m+p}) \cdot (q+m-p)}$

$$= \frac{(p-q+m)}{(q-p+m)} = \frac{4m+m}{-4m+m} = \frac{5m}{-3m} = -\frac{5}{3}$$

Cevap: A

13. $\frac{a^2b + b^2a}{a^2 - b^2} \cdot \frac{ab^2 - a^2b}{a^2 - 2ab + b^2}$

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

Cevap: B

14. $\sqrt{x+12} + \sqrt{x} = 6$

$$x \quad \sqrt{x+12} - \sqrt{x} = A$$

$$(\sqrt{x+12})^2 - (\sqrt{x})^2 = 6A$$

$$x + 12 - x = 6 \cdot A$$

$$12 = 6 \cdot A$$

$$2 = A$$

Cevap: B

15. $x^2 - y^2 = (x-y)(x+y) = (2m-n-2m-n) \cdot (2m-n+2m+n)$

$$= -2n \cdot 4m$$

$$= -8mn$$

$$= -8 \cdot -4$$

$$= 32$$

Cevap: C

16. $\frac{x - \sqrt{x}}{(x-1)^2} : \frac{x}{x + \sqrt{x}} = 3$

$$\frac{x - \sqrt{x}}{(x-1)^2} \cdot \frac{x + \sqrt{x}}{x} = 3$$

$$\frac{x^2 - x}{(x-1)^2 \cdot x} = 3 \Rightarrow \frac{x(x-1)}{(x-1)^2 \cdot x} = 3$$

$$\Rightarrow \frac{1}{x-1} = 3$$

$$3x - 3 = 1$$

$$3x = 4$$

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

Cevap: B

17. $\left(\frac{x^2}{x-3} + \frac{9}{3-x}\right) \cdot \left(\frac{1}{x^2+x-6}\right)$

$$= \frac{x^2-9}{x-3} \cdot \frac{1}{(x+3)(x-2)}$$

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

Cevap: A

18. $\frac{a^2+a-6}{a^2-9} \cdot \frac{a^2-6a+9}{3a-9} = 5$

$$\frac{(a+3)(a-2)}{(a+3)(a-3)} \cdot \frac{(a-3)^2}{3(a-3)} = \frac{a-2}{3} = 5$$

$$a-2 = 15$$

$$a = 17$$

Cevap: E

19. $\frac{x^2+2mx+7}{x^2+6x+5} = \frac{x+7}{x+5}$

$$\frac{(x+7) \cdot (x+1)}{(x+5)(x+1)} = \frac{x+7}{x+5}$$

$$x^2+2mx+7 = (x+7)(x+1)$$

$$x^2+2mx+7 = x^2+8x+7$$

$$\Rightarrow 2m = 8$$

$$m = 4$$

Cevap: B

20. • $x-7y=4 \Rightarrow x-4=7y$ olur.

$$\bullet \frac{x^2-8x+16}{7y^2}$$

$$= \frac{(x-4)^2}{7y^2}$$

$$= \frac{(7y)^2}{7y^2}$$

$$= \frac{49y^2}{7y^2} = 7 \text{ olur.}$$

Cevap: E

21. $\begin{array}{l} a \quad 5b \\ \quad \times \\ a \quad -9b \end{array}$

$$\frac{a^2-4ab-45b^2}{a-9b} = 10$$

$$\frac{(a+5b)(a-9b)}{a-9b} = 10 \Rightarrow a+5b = 10$$

$$a+5b = 10$$

$$- \quad a+b = 6$$

$$4b = 4 \Rightarrow b = 1$$

Cevap: A

22. $a + b + c = x$

$$(a + b + c)^2 = x^2$$

$$\underbrace{a^2 + b^2 + c^2}_{41} + \underbrace{2(ab + bc + ac)}_{20} = x^2$$

$$41 + 40 = x^2$$

$$x^2 = 81$$

$$x = 9$$

Cevap: A

23. $a - \frac{1}{a} = 2\sqrt{5}$

$$\left(a - \frac{1}{a}\right)^2 = (2\sqrt{5})^2 \Rightarrow a^2 - 2 + \frac{1}{a^2} = 20$$

$$a^2 + \frac{1}{a^2} = 22$$

$$\Rightarrow \left(a + \frac{1}{a}\right)^2 = a^2 + 2 + \frac{1}{a^2} = 22 + 2 = 24 \text{ olur.}$$

Cevap: B

24. • $c(a + b) = 2$

$$a + b = \frac{2}{c}$$

$$\Rightarrow \left(c + \frac{2}{c}\right)^2 = 5^2$$

$$c^2 + \frac{4}{c^2} + 4 = 25 \Rightarrow c^2 + \frac{4}{c^2} = 21$$

• $a + b + c = 5$

$$\left(\frac{2}{c} + c\right) = 5$$

Cevap: A

25. • $x^2y - xy^2 - x + y = 84$

$$xy(x - y) - (x - y) = 84$$

$$(x - y)(xy - 1) = 84$$

$$(x - y)(15 - 1) = 84$$

$$(x - y) \cdot 14 = 84$$

$$x - y = 6 \text{ olur.}$$

• $(x - y)^2 = 6^2$ (her iki tarafın karesi alınır)

$$x^2 - 2xy + y^2 = 36$$

$$x^2 - 30 + y^2 = 36$$

$$x^2 + y^2 = 66 \text{ olur.}$$

Cevap: C

26. $z(x + y) = xy + 5$

$$xz + yz = xy + 5$$

$$xz + yz - xy = 5$$

$$x + y = z + 4$$

$$(x + y - z)^2 = (4)^2$$

$$x^2 + y^2 + z^2 + 2(xy - xz - yz) = 16$$

$$= -5$$

$$x^2 + y^2 + z^2 - 10 = 16$$

$$x^2 + y^2 + z^2 = 26$$

Cevap: C

27. $x + y = xy$ olduğuna göre,

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

$$= \frac{x^2 + 2x + y^2 + 2y}{(xy)^2}$$

$$= \frac{x^2 + y^2 + 2(x + y)}{(xy)^2} = \frac{x^2 + y^2 + 2xy}{(x + y)^2}$$

$$= \frac{(x + y)^2}{(x + y)^2} = 1 \text{ bulunur.}$$

Cevap: A

28. $x + \frac{2}{x+2} = 2$ (her tarafa 2 eklenir.)

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

$$(x + 2)^2 + 4 + \frac{4}{(x + 2)^2} = 16$$

$$x^2 + 4x + 4 + \frac{4}{x^2 + 4x + 4} = 12$$

$$x^2 + 4x + \frac{4}{x^2 + 4x + 4} = 8$$

Cevap: B

29. • $x + y + z = 0$
 $x + y = -z \Rightarrow (x + y)^2 = z^2$ olur.

• $\frac{x}{y} + \frac{y}{x} - \frac{z^2}{x \cdot y} = \frac{x^2 + y^2 - z^2}{xy}$
 $= \frac{x^2 + y^2 - (x + y)^2}{xy} = \frac{x^2 + y^2 - x^2 - 2xy - y^2}{xy}$
 $= \frac{-2xy}{xy} = -2$ olur.

Cevap: B

30. $\frac{3 - \sqrt{x}}{\sqrt{x}(\sqrt{x} - 3)} - \frac{\sqrt{x}}{\sqrt{x} \cdot \sqrt{x}} = -\frac{1}{3}$

$-\frac{1}{\sqrt{x}} - \frac{1}{\sqrt{x}} = -\frac{1}{3}$

$-\frac{2}{\sqrt{x}} = -\frac{1}{3}$

$\sqrt{x} = 6$

$x = 36$ olur.

Cevap: E

31. $3^{2x} - 4 \cdot 3^x + 3 = 0$

$t^2 - 4t + 3 = 0$
 $\begin{array}{cc} / & \backslash \\ -3 & -1 \end{array}$

$(t - 3) \cdot (t - 1) = 0 \Rightarrow t = 3$ ya da $t = 1$

O halde $3^x = 3^1$ $3^x = 1 = 3^0$

$x = 1$

$x = 0$

ve çarpımları $1 \cdot 0 = 0$ olur.

Cevap: A

32. $x^2 - 10x + a = (x + b)(x - 6)$

$a = -6 \cdot b$ $-10 = -6 + b$

$a = -6 \cdot -4$ $b = -4$

$a = 24$

$\Rightarrow a + b = 24 + (-4) = 20$

Cevap: C

33. $\frac{1}{x^2 + 4x + 1} = \frac{1}{(x+2)^2 + 1} = \frac{1}{1} = 1$

Cevap: E

34. $x + \frac{1}{x-2} = 5$

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

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

$(x-2)^2 + 2 \cdot (x-2) \cdot \frac{1}{x-2} + \frac{1}{(x-2)^2} = 9$

$(x-2)^2 + \frac{1}{(x-2)^2} = 7$

Cevap: B

35. $x^{-1} + y^{-1} = \frac{3}{4}$

$\frac{1}{x} + \frac{1}{y} = \frac{3}{4}$
 $\begin{array}{cc} (y) & (x) \end{array}$

$\frac{x+y}{x \cdot y} = \frac{3}{4} \Rightarrow \frac{\overset{2}{6}}{x \cdot y} \times \frac{3}{4}$

$x \cdot y = 8$

$\Rightarrow (x+y)^2 = (6)^2$

$x^2 + y^2 + 16 = 36$

$x^2 + y^2 = 20$

Cevap: A

36. Sayılar x ve y olsun. ($x > y$)

Volkan $x^2 - y^2$ işlemini bulur.

İbrahim $(x - y)^2$ işlemini bulur.

O halde;

$$x^2 - y^2 = 6(x - y)^2$$

$$(x - y) \cdot (x + y) = 6(x - y) \cdot (x - y)$$

$$x + y = 6x - 6y$$

$$7y = 5x$$

↓

$$5k + 7k = 12k \Rightarrow 12\text{'nin katı olan 72 olabilir.}$$

Cevap: D

37. $2x^2 + 3xy - 2y^2 = 42$

↓

$$2x \quad -y \quad (2x - y) \cdot (x + 2y) = 42$$

$$x \quad 2y \quad (2x - y) \cdot 6 = 42$$

$$2x - y = 7 \text{ olur.}$$

$$2 / 2x - y = 7$$

$$\frac{x + 2y = 6}{4x - 2y = 14}$$

$$4x - 2y = 14$$

$$x + 2y = 6$$

+

$$5x = 20$$

$$x = 4$$

$$\bullet x + 2y = 6$$

$$4 + 2y = 6$$

$$2y = 2$$

$$y = 1$$

$$\bullet x + y = 4 + 1 = 5$$

Cevap: E

38. $3xy^2 + x^3 = 260$

$$+ \quad -/3x^2y + y^3 = 252$$

$$x^3 - 3x^2y + 3xy^2 - y^3 = 8$$

$$(x - y)^3 = 2^3$$

$$x - y = 2$$

Cevap: D

39. $\left(\frac{a}{a+1} + \frac{1}{a}\right)^{-1} : \frac{a}{a^3 - 1}$

$$\left(\frac{a^2 + a + 1}{a(a+1)}\right)^{-1} : \frac{a}{(a-1)(a^2 + a + 1)}$$

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

$$(a+1)(a-1) = a^2 - 1$$

Cevap: C

40. $\frac{x-y-\sqrt{x}+\sqrt{y}}{\sqrt{x}+\sqrt{y}-1} = 3$

$$\frac{x - \sqrt{y}(\sqrt{x} + \sqrt{y}) - (\sqrt{x} - \sqrt{y})}{\sqrt{x} + \sqrt{y} - 1} =$$

$$\frac{(\sqrt{x} - \sqrt{y})(\sqrt{x} + \sqrt{y} - 1)}{\sqrt{x} + \sqrt{y} - 1} = 3$$

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

$$x - 2\sqrt{xy} + y = 9$$

$$x - 2 \cdot \sqrt{4} + y = 9$$

$$x - 4 + y = 9$$

$$x + y = 13$$

Cevap: D