ÇÖZÜMLER

1.
$$\frac{\dfrac{0,0020}{0,0002}+\dfrac{0,003}{0,300}}{\dfrac{3}{100}-\dfrac{0,0002}{0,0100}}=\frac{\dfrac{20}{2}+\dfrac{3}{300}}{\dfrac{3}{100}-\dfrac{2}{100}}$$

$$\frac{10+\dfrac{1}{100}}{\dfrac{1}{100}}=\frac{\dfrac{1001}{100}}{\dfrac{1}{100}}=1001$$

Cevap: C

5.
- $15^a = 3 \implies 15^{ab} = 3^b$
- $15^{(1-a)3b} = 15^{3b-3ab} = 15^{3b}\cdot\dfrac{1}{(15^{ab})^3}$

$$= 15^{3b}\cdot\frac{1}{3^{3b}} = 5^{3b}$$
$$= (5^b)^3$$
$$= 2^3 = 8$$

Cevap: C

2.
$$\frac{8.10^{-6}+12.10^{-4}}{201.10^{-6}+403.10^{-6}}=\frac{8.10^{-6}+1200.10^{-6}}{201.10^{-6}+403.10^{-6}}$$

$$\frac{1208.10^{-6}}{604.10^{-6}}=2$$

Cevap: D

6.
$$\frac{(3^x)^3+(2^x)^3}{9^x-6^x+4^x}\cdot\frac{2^x-3^x}{2^x+3^x}=\frac{(3^x+2^x)(9^x-6^x+4^x)}{9^x-6^x+4^x}$$

$$= 2^x - 3^x$$

Cevap: C

3.
$$\frac{\sqrt{2(2+\sqrt3)}}{\sqrt2}-\frac{\sqrt{2(2-\sqrt3)}}{\sqrt2}$$

$$\frac{\sqrt{4+2\sqrt3}}{\sqrt2}-\frac{\sqrt{4-2\sqrt3}}{\sqrt2}=\frac{\sqrt3+1-\sqrt3+1}{\sqrt2}$$

$$= \frac{2}{\sqrt2}=\sqrt2$$

Cevap: B

7.
$$\left(17-\frac{3}{16}\right)\left(17-\frac{4}{16}\right)\cdots\left(17-\frac{272}{16}\right)\cdots\left(17-\frac{279}{16}\right)$$

$$\left(17-\frac{3}{16}\right)\left(17-\frac{4}{16}\right)\cdots(17-17)\cdots\left(17-\frac{279}{16}\right)$$
$$\downarrow$$
$$\ldots\ 0\ \ldots$$

$= 0$ olur.

Cevap: C

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

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

$$\frac{81}{\underset{2}{3(x+z)}-y}=3 \rightarrow \frac{81}{6-y}=3$$

$$81 = 18-3y$$
$$3y = -63$$
$$y = -21$$

Cevap: E

8.
$$\frac{1}{x+1}\times\frac{x-1}{x^2-6x+9}$$
$$x^2-6x+9=x^2-1$$
$$-6x+9=-1$$
$$-6x=-10$$
$$x=\frac{5}{3}$$

Cevap: A

9. $\dfrac{a+b}{2a+3b} \diagup \dfrac{2}{3} \Rightarrow 3a + 3b = 4a + 6b$

$$\boxed{-3b = a}$$

$\Rightarrow \dfrac{b^2 - ab}{\underset{-3b}{2a^2} - b^2} = \dfrac{b^2 + 3b^2}{2 \cdot 9b^2 - b^2} = \dfrac{4b^2}{17b^2} = \dfrac{4}{17}$

Cevap: D

10. $\dfrac{0,004 + 0,0104}{\dfrac{0,36}{4} + \dfrac{3}{100}} = \dfrac{0,0144}{\dfrac{36}{400} + \dfrac{3}{100}}$

$\dfrac{0,0144}{\dfrac{9}{100} + \dfrac{3}{100}} = \dfrac{0,0144}{\dfrac{12}{100}} = \dfrac{144}{10000} \cdot \dfrac{100}{12}$

$= \dfrac{12}{100}$

$= 0,12$

Cevap: D

11.
$$\begin{array}{r} x - 3y + 4z = -3 \\ + \quad 2/ \; 4x + 6y - 2z = 6 \\ \hline 9x + 9z = 9 \\ x + z = 1 \end{array}$$

Cevap: C

12. $|x - y| + |y - x| + |x| + x + y$

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

$= 3y - 2x$

Cevap: A

13. $12 + \cfrac{\cfrac{\cfrac{18}{5 - \cfrac{6}{3\left(1 + \cfrac{1}{x}\right)}}}{ }}{ }^{9}{}_{2} = 21$

$\Rightarrow \dfrac{6}{2\left(1 + \dfrac{1}{x}\right)^{1}} = 3 \Rightarrow \dfrac{1}{x} = 1 \Rightarrow x = 1$

Cevap: C

14. $12^{25} \equiv x \pmod 5 \Rightarrow 2^{25} \equiv x \pmod 5$

$17^{12} \equiv y \pmod 5 = 2^{12} \equiv y \pmod 5$

$2^1 = 2$ $2^{25} \equiv 2^1 \equiv x \Rightarrow x = 2$

$2^2 = 4$ $2^{12} \equiv 2^0 \equiv y \Rightarrow y = 1$
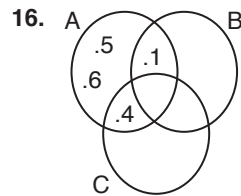
$2^3 = 3$ $x + y = 2 + 1 = 3$

$2^4 = 1$ $3 \equiv -2 \pmod 5$

Cevap: B

15. $\left(\dfrac{125}{100}\right)^{-1} \cdot \left(\dfrac{2}{10}\right)^{-3} \cdot \dfrac{1}{5^2}$

$\dfrac{100}{\cancel{125}} \cdot \dfrac{\cancel{1000}}{\cancel{8}} \cdot \dfrac{1}{25} = \dfrac{100}{25} = 4$

Cevap: D

16.

$B \cup C = \{1, 2, 3, 4, 7, 8\}$

Cevap: D

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17. $(f o g)(x) = x$

$f(\underbrace{g(x)}_{-3}) = x$

$\Rightarrow g(x) = \dfrac{x^2 - 7x - 2}{x + 2} = -3$

$x^2 - 7x - 2 = -3x - 6$

$x^2 - 4x + 4 = 0$

$(x - 2)^2 = 0$

$x = 2$

Cevap: E

18. $\dfrac{f(2) + f(0) + g(-1)}{f^{-1}(0) + g^{-1}(0)} = \dfrac{3 + 2 + 0}{-3 - 1}$

$= \dfrac{-5}{4}$

Cevap: C

19.
- $f(3) = 3m + n = 8$
- $f^{-1}(4) = 5 \Rightarrow f(5) = 4$

$f(5) = 5m + n = 4$

$\Rightarrow \begin{array}{r} -/ \quad 3m + n = 8 \\ + \quad 5m + n = 4 \\ \hline 2m = -4 \Rightarrow m = -2 \end{array}$ $\quad \to \quad \begin{array}{l} -6 + n = 8 \\ n = 14 \end{array}$

$\Rightarrow f(x) = -2x + 14$

$f(1) = -2 + 14 = 12$

Cevap: B

20. $x = 1 \Rightarrow \quad f(1) + 3f(0) + 1 = 0$

$x = 0 \Rightarrow \quad \underline{+ \ ^{-3/} \quad f(0) + 3f(1) = 0}$

$-8f(1) + 1 = 0$

$-8f(1) = -1$

$f(1) = \dfrac{1}{8}$

Cevap: A

21. Elma = x

Armut = 60 − x

$x \cdot \dfrac{7}{100} + (60 - x)\dfrac{5}{100} = 3{,}5$

$7x + 300 - 5x = 350$

$2x = 50$

$x = 25 \Rightarrow 25 \cdot \dfrac{93}{100} = 23{,}25$

Cevap: B

22. $\dfrac{8!}{8! + 7! + 6!} = \dfrac{8!}{6!(8 \cdot 7 + 7 + 1)}$

$= \dfrac{8!}{6! \cdot 64} = \dfrac{8 \cdot 7}{\underset{8}{64}}$

$= \dfrac{7}{8}$

Cevap: E

23. $n + (n - 1) + (n - 2) + \dots + 4 + 3 + 2 + 1 = 117 + 2 + 1$

$\dfrac{n \cdot (n + 1)}{2} = 120$

$\underset{15}{n} \cdot \underset{16}{(n + 1)} = 240 \Rightarrow n = 15$

Cevap: C

24. $\blacksquare \square \triangle = 7(\square \triangle)$

$100\blacksquare + \square \triangle = 7(\square \triangle)$

$100\blacksquare = 6(\square \triangle)$

$50 \cdot \blacksquare = 3(\square \triangle)$

$\blacksquare = 3 \qquad \square \triangle = 50$

$\Rightarrow \blacksquare + \square + \triangle = 3 + 5 + 0 = 8$ olur.

Cevap: C

25. $r = \dfrac{-a}{2}$

$\Rightarrow f\left(\dfrac{-a}{2}\right) = -2$

$\left(-\dfrac{a}{2}\right)^2 + a \cdot \dfrac{-a}{2} + 7 = -2$

$\dfrac{a^2}{4} - \dfrac{a^2}{2} = -9$

$\dfrac{-a^2}{4} = -9 \Rightarrow -a^2 = -36$

$\boxed{a = 6}$

Cevap: C

26. $A = 1 + 2 + 2^2 + \ldots + 2^{24}$

$B = 1 + 2A$

$= 1 + 2(1 + 2 + 2^2 + \ldots + 2^{24})$

$= 1 + 2 + 2^2 + \ldots + 2^{24} + 2^{25}$

$= (1 + 2 + 2^2 + \ldots + 2^{24}) + 2^{25}$

$= A + 2^{25}$

$B - A = A + 2^{25} - A = 2^{25}$

Cevap: B

27. · $q = \dfrac{|p|}{3}$ ise $|p| = 3q$ olduğundan

$p = 3q$ ve $p = -3q$ olur.

· $p = 3q$ ve $q > 0$ için

$2p = 7 - |q|$

$2 \cdot 3q = 7 - q$

$7q = 7 \Rightarrow q = 1$ ve $p = 3 \cdot 1 = 3$

O halde $p + q = 3 + 1 = 4$

· $p = -3q$ ve $q > 0$ için

$2p = 7 - |q|$

$2 \cdot (-3q) = 7 + q$

$-7q = 7 \Rightarrow q = -1$ olur ama $q > 0$ olmalıydı.

O halde $p + q = 4$ olur.

Cevap: B

28. · $x^2y - xy^2 - x + y = 84$

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

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

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

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

$x - y = 6$ olur.

· $(x - y)^2 = 6^2$ (her iki tarafın karesi alınırsa)

$x^2 - 2\overset{15}{\overbrace{xy}} + y^2 = 36$

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

$x^2 + y^2 = 66$ olur.

Cevap: C

29.

$\begin{array}{l} {}^{2/}\quad 3\sqrt{x} + 4\sqrt{y} = 4 \\ {}^{3/}\quad 5\sqrt{y} - 2\sqrt{x} = 5 \\ \hline \qquad\quad 23\sqrt{y} = 23 \\ \qquad\qquad \sqrt{y} = 1 \\ \qquad\qquad\quad y = 1 \end{array}$

$\begin{array}{l} 3\sqrt{x} + 4 = 4 \\ 3\sqrt{x} = 0 \\ \quad x = 0 \end{array}$

$\Rightarrow x + y = 0 + 1 = 1$

Cevap: D

30. $\dfrac{2^{a-1}}{3} + \dfrac{2}{2^{-a}} = \dfrac{52}{3}$

$\dfrac{2^{a-1}}{3} + 2^{1+a} = \dfrac{52}{3}$

$\dfrac{2^{a-1} + 3 \cdot 2^{a+1}}{3} = 52$

$2^a\left(\dfrac{1}{2} + 3 \cdot 2\right) = 52$

$2^a \dfrac{\overset{}{13}}{2} = \overset{4}{52}$

$2^a = 8 = 2^3 \Rightarrow a = 3$ olur.

Cevap: A

31. $\cancel{n}.\cancel{(n-1)}\cancel{(n-2)}(n-3) = 3\cancel{n}\cancel{(n-1)}\cancel{(n-2)}$

$$n = 6$$

Cevap: B

32. $x + \dfrac{12}{\sqrt{x}} = x + \dfrac{x + \sqrt{x}}{\sqrt{x}}$

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

$$= 12 + 1 = 13$$

Cevap: D

33. $+5 + 6 + 2 - 1 - 2 = +10$

$$\Rightarrow 64 + \dfrac{10}{5} = 64 + 2 = 66$$

Cevap: C

34. $15, 13, 11, \ldots, 5 \Rightarrow \dfrac{15-5}{2} + 1 = 6$ sıra

$$15 + 13 + 11 + 9 + 7 + 5 = 60$$

$$\Rightarrow m + n = 60 + 6 = 66$$

Cevap: A

35. $n = 14 \Rightarrow a_{14} = \dfrac{a_{15} + a_{13}}{2}$

$$2a_{14} = a_{15} + a_{13}$$

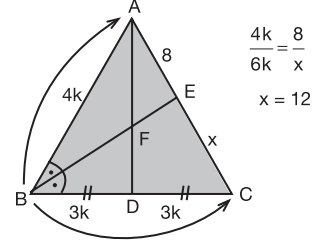$$a_{14} + a_{14} = a_{15} + a_{13} \Rightarrow a_{14} - a_{13} = a_{15} - a_{14}$$

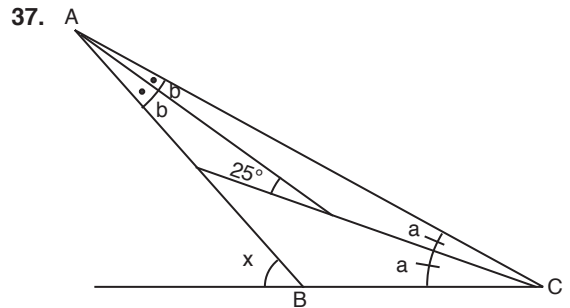$$\Rightarrow \dfrac{a_{15} - a_{14}}{a_{14} - a_{13}} = 1$$

Cevap: B

36. ABD üçgeninde açıortay teoremi uygulandığında aşağıdaki gibi kenar oranları elde edilir.
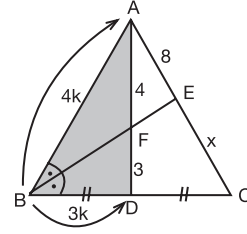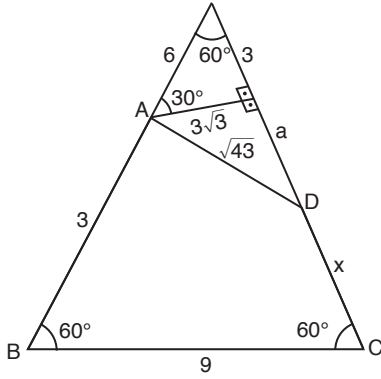

ABC üçgeninde açıortay teoremi uygulanırsa;

$$\dfrac{4k}{6k} = \dfrac{8}{x}$$

$$x = 12$$

Cevap: A

37.

- $a + b = 25°$
- $2(a + b) = x$
- $\Rightarrow 2 \cdot 25° = x$
- $x = 50°$

Cevap: D

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38.

$$(3\sqrt{3})^2 + a^2 = (\sqrt{43})^2$$
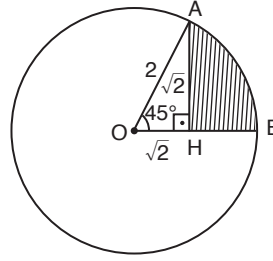
$$27 + a^2 = 43$$

$$a^2 = 16$$

$$a = 4$$

$$\Rightarrow \; 3 + a + x = 9$$

$$3 + 4 + x = 9 \;\; \Rightarrow \;\; x = 2$$

Cevap: B

39.

- $\dfrac{4}{10} = \dfrac{a}{20} \; \Rightarrow \; a = 8$

- $\dfrac{a}{20} = \dfrac{2}{b}$

  $\dfrac{8}{20} = \dfrac{2}{b} \; \Rightarrow \; 8b = 40$

  $$b = 5$$

$\Rightarrow a + b = 8 + 5 = 13$

Cevap: C

40.

$$\frac{45}{360}\pi 2^2 - \frac{\sqrt{2}\,\sqrt{2}}{2} = \frac{\pi}{2} - 1$$

Cevap: C

41.

- $a = 6 , \;\; b = 6$

  $6^2 \; \blacksquare \; \dfrac{2 \cdot 6}{3} = 3 \cdot 6 + 6 \; \Rightarrow \; 36 \; \blacksquare \; 4 = 24$

- $a = 12 \;\; b = 18$

  $2 \cdot 12 \; \bullet \; 18 = \dfrac{12}{2} + \dfrac{18}{3} = 6 + 6 = 12$

Cevap: C

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