

1.

$$\frac{a}{6} = \frac{6}{-9} \Rightarrow a = -4 \text{ ve}$$

$$a_n = \frac{-4n+6}{6n-9} = \frac{-2(2n-3)}{3(2n-3)} = -\frac{2}{3} \text{ tür.}$$

$$(a_n) = \left(-\frac{2}{3}\right) \text{ tür. } a + a_{10} = -4 + \left(-\frac{2}{3}\right) = -\frac{14}{3} \text{ bulunur.}$$

(Cevap B)

2.

$$\frac{n+3}{2n+19} < \frac{1}{3} \Rightarrow \frac{n+3}{2n+19} - \frac{1}{3} < 0$$

$$\Rightarrow \frac{3n+9-2n-19}{3(2n+19)} < 0$$

$$\Rightarrow n-10 < 0$$

$$\Rightarrow n < 10$$

Dizinin n terimi $\frac{1}{3}$ ten küçüktür.

(Cevap D)

3.

$$a_n = b_n \Rightarrow \frac{8n+k}{2n-1} = \frac{4(2n-1)+7}{2n-1}$$

$$\Rightarrow 8n+k = 8n+3$$

$$\Rightarrow k = 3$$

(Cevap E)

4.

$$\frac{3n-12}{-3n+6} \cdot \frac{n+2}{3} \Rightarrow \frac{3n-12}{n+2} = 3 - \frac{18}{n+2}$$

$$n+2 = 3 \Rightarrow n = 1, n+2 = 6 \Rightarrow n = 4, n+2 = 9 \Rightarrow n = 7$$

n+2 = 18 ⇒ n = 16 olmak üzere, dizinin 4 terimi tam sayıdır.

(Cevap B)

5.

$$a_{81} = 4 (n = 3^4)$$

$$a_{10} = 0 (n \neq 3^k)$$

$$a_9 = 2 (n = 3^2)$$

$$a_{81} - 2a_{10} + 3a_9 = 4 - 0 + 6 = 10$$

(Cevap C)

6.

$$\frac{2n-17}{3n-7} < 0 \quad \frac{n}{a_n} \quad \frac{7}{3} \quad \frac{17}{2}$$

$$3 \leq a_n \leq 8$$

(a_n) dizisinin 6 terimi negatiftir.

(Cevap C)

7.

$$\frac{a_{n+1}}{a_{n+2}} = \frac{2^{n+1}}{2^{n+2}} = \frac{2^{n+1}}{n+2} \cdot \frac{n+3}{2^{n+2}} = \frac{n+3}{2(n+2)}$$

(Cevap D)

8.

$$\frac{2n+15}{n+3} > \frac{7}{2} \Rightarrow \frac{2n+15}{n+3} - \frac{7}{2} > 0$$

$$\Rightarrow \frac{-3n+9}{2(n+3)} > 0$$

$$\Rightarrow -3n+9 > 0$$

$$\Rightarrow n < 3$$

a₁ ve a₂ terimleri $\frac{7}{2}$ den büyüktür.

(Cevap A)

9.

$$\begin{aligned}\frac{1}{n^2+n} &= \frac{1}{n} - \frac{1}{n+1} \\ &= \left(\frac{1}{1} - \frac{1}{2}\right) + \left(\frac{1}{2} - \frac{1}{3}\right) + \dots + \left(\frac{1}{10} - \frac{1}{11}\right) \\ &= 1 - \frac{1}{11} = \frac{10}{11}\end{aligned}$$

(Cevap C)

10.

$$\begin{aligned}a_1 &= 0, a_2 = 4 \text{ ve } a_3 = 5 \text{ tir.} \\ a_1 + a_2 + a_3 &= 9 \text{ bulunur.}\end{aligned}$$

(Cevap D)

11.

$$\begin{aligned}a_n &= \frac{P_n}{P_{n-1}} = \frac{2^{n^2+n}}{(n+1)!} \\ &= \frac{2^{n^2+n-(n-1)^2-(n-1)}}{n+1} \\ &= \frac{2^{2n}}{n+1} \\ &= \frac{4^n}{n+1}\end{aligned}$$

(Cevap D)

12.

$$\begin{aligned}a_n &= (n-1)^2 + 4 \\ n = 1 \text{ için } a_n &= 4 \text{ olur.}\end{aligned}$$

(Cevap C)

13.

$$\begin{aligned}a_2 &= 1 \cdot a_1 \\ a_3 &= 2 \cdot a_2 \\ a_4 &= 3 \cdot a_3 \\ &\vdots \\ a_{15} &= \frac{14 \cdot a_{14}}{x}\end{aligned}$$

$$a_{15} = 14! \cdot a_1 \Rightarrow a_{15} = 14!$$

(Cevap B)

14.

$$\begin{aligned}\text{Dizi, bir kare sayı dizisidir.} \\ a_{12} &= 12^2 = 144 \text{ bulunur.}\end{aligned}$$

(Cevap C)

15.

$$(a_n) = \left(\frac{n(n+1)}{2}\right) \text{ üçgen sayı dizisidir.}$$

$$n = 20 \text{ için } a_{20} = \frac{20 \cdot 21}{2} = 210 \text{ bulunur.}$$

(Cevap E)

16.

$$n = 1 \text{ için, } a_2 + 1 = a_1$$

$$n = 2 \text{ için, } a_3 + 2 = a_2$$

$$n = 3 \text{ için, } a_4 + 3 = a_3$$

:

$$n = 18 \text{ için, } \begin{array}{l} a_{19} + 18 = a_{18} \\ + \quad + \end{array}$$

$$a_{19} + \frac{18 \cdot 19}{2} = a_1 \Rightarrow a_{19} = 19 - 171 = -152$$

(Cevap B)

1.

$$\frac{3n+7}{2n} = \frac{31}{16} \Rightarrow n = 8$$

(Cevap D)

2.

$$\begin{aligned} \frac{2n+17}{n+5} > \frac{5}{2} &\Rightarrow \frac{2n+17}{n+5} - \frac{5}{2} > 0 \\ &\Rightarrow \frac{4n+34-5n-25}{2n+10} > 0 \\ &\Rightarrow \frac{-n+9}{2n+10} > 0 \end{aligned}$$

bulunur. Kesrin paydası pozitif olduğu için $-n+9 > 0$ olmalıdır.

$$-n+9 > 0 \Rightarrow n < 9$$

elde edilir.

 $n = 1, 2, 3, 4, 5, 6, 7, 8$ olmak üzere, dizinin 8 terimi $\frac{5}{2}$ den büyüktür.

(Cevap C)

3.

$$\frac{2}{1} = \frac{7}{a} \Rightarrow a = \frac{7}{2}$$

(Cevap B)

4.

$$\begin{aligned} \frac{1}{n(n+1)} &= \frac{1}{n} - \frac{1}{n+1} \\ \frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{n} - \left(\frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \dots + \frac{1}{n+1} \right) \\ 1 - \frac{1}{n+1} &= 1 \end{aligned}$$

(Cevap C)

5.

$$\begin{aligned} -\frac{b}{2a} &= \frac{-17}{-4} = 4 + \frac{1}{4} \\ a_4 &= -2 \cdot 16 + 68 + 1 = 37 \end{aligned}$$

(Cevap C)

6.

$$\begin{aligned} a_n = b_n &\Rightarrow \frac{xn+5}{2n+1} = \frac{3n+15}{6n+y} \\ &\quad (3) \quad (1) \\ &\Rightarrow \frac{3xn+15}{6n+3} = \frac{3n+15}{6n+y} \\ &\Rightarrow 3x = 3 \text{ ve } 3 = y \\ &\Rightarrow x = 1 \text{ ve } y = 3 \text{ bulunur.} \end{aligned}$$

 $x + y = 4$ tür.

(Cevap B)

7.

$$\begin{aligned} \frac{2n+18}{12} \Big| \frac{n+3}{2} &\quad a_n = 2 + \frac{12}{n+3} \\ a_1 &= 2 + 3 = 5 \\ a_3 &= 2 + 2 = 4 \\ a_9 &= 2 + 1 = 3 \end{aligned}$$

olmak üzere, dizinin 3 terimi tam sayıdır.

(Cevap A)

8.

$$a_4 - a_3 = (4^2 + 1) - (3^2 - 1) = 9$$

(Cevap B)

9.

$$c_1 = \cos \pi = -1$$

$$c_2 = \cos 2\pi = 0$$

$$c_3 = \cos 3\pi = -1$$

(c_n) sabit dizi değildir.

(Cevap C)

10.

$$\frac{3n-20}{2n-5} < 0 \quad \frac{n}{a_n} \quad \frac{5}{2} \quad \frac{20}{3}$$

$$\frac{5}{2} < a_n < \frac{20}{3} \Rightarrow a_3, a_4, a_5, a_6 \text{ negatiftir.}$$

(Cevap C)

11.

$$-2n + 21 > 0 \Rightarrow -2n > -21$$

$$\Rightarrow n < \frac{21}{2}$$

$a_1, a_2, a_3, \dots, a_{10}$ terimleri pozitifdir.

(Cevap C)

12.

$$S_6 - S_2 = (36 + 6 - 3) - (4 + 2 - 3)$$

$$= 30$$

(Cevap B)

13.

$$a_5 + a_6 + a_7 = 4 + 2^6 + (2 \cdot 7 - 1) = 81$$

(Cevap E)

14.

$$3^2 + 3^3 + 3^4 + \dots + 3^{15} - (3 + 3^2 + 3^3 + \dots + 3^{14}) = 3^{15} - 3$$

3^{15} sayısı 9 ile tam bölünür. Bu sayıdan 3 çıkarıldığında, kalan sayının 9 ile bölümünden kalan 6 olur.

(Cevap D)

15.

Dizi, bir üçgen sayı dizisidir.

$$a_n = \frac{n(n+1)}{2} \Rightarrow a_{15} = \frac{15 \cdot 16}{2} = 120$$

(Cevap B)

16.

$$(a_n) = \left(\frac{1}{n(n+1)} \right) = \left(\frac{2}{n(n+1)} \right) = \left(\frac{2}{n} - \frac{2}{n+1} \right)$$

$$a_1 + a_2 + a_3 + \dots = \frac{1}{1} + \frac{1}{1+2} + \frac{1}{1+2+3} + \dots$$

$$\frac{2}{1} + \frac{2}{2} + \frac{2}{3} + \dots + \frac{2}{n} - \left(\frac{2}{2} + \frac{2}{3} + \frac{2}{4} + \dots + \frac{2}{n+1} \right)$$

$$= \frac{2}{1} - \frac{2}{n+1} = 2$$

(Cevap D)

1.

$$10, 15, 20, 25, \dots, 55 = \frac{(10+55) \cdot 10}{2} = 325$$

(Cevap D)

2.

$$\left. \begin{array}{l} 2a_1 + (a_1 + 12d) = 0 \Rightarrow 3a_1 + 12d = 0 \\ (a_1 + 5d) + (a_1 + 7d) = 12 \Rightarrow 2a_1 + 12d = 12 \end{array} \right\} \Rightarrow a_1 = 4$$

(Cevap B)

3.

$$\left. \begin{array}{l} a_5 = 34 \Rightarrow a_1 + 4d = 34 \\ a_8 = 52 \Rightarrow a_1 + 7d = 52 \end{array} \right\} \Rightarrow a_1 = 10, d = 6$$

$$a_{15} = a_1 + 14d = 10 + 14 \cdot 6 = 94$$

(Cevap E)

4.

$$a_{21} = 36 \Rightarrow a_1 + 20d = 36 \Rightarrow 6 + 20d = 36$$

$$\Rightarrow d = \frac{3}{2}$$

$$a_{25} = a_1 + 24d = 6 + 24 \cdot \frac{3}{2} = 42$$

$$S_{25} = \frac{(6+42) \cdot 25}{2} = 600$$

(Cevap C)

5.

$$a_{11} = S_{11} - S_{10} = (2 \cdot 11^2 + 3 \cdot 11) - (2 \cdot 10^2 + 3 \cdot 10)$$

$$= 275 - 230$$

$$= 45$$

(Cevap C)

6.

$$a_1 = 15, a_{10} = 42, d = \frac{a_{10} - a_1}{10 - 1} = \frac{42 - 15}{9} = 3$$

(Cevap B)

7.

$$\frac{a_7 + a_8 + a_9 + \dots + a_{18}}{12 \text{ terim}} = \frac{(a_7 + a_{18}) \cdot 12}{2}$$

$$= \frac{(16 + 38) \cdot 12}{2}$$

$$= 324$$

(Cevap D)

8.

$$S_{11} - S_{10} = a_{11} = \frac{11^2 + 3 \cdot 11}{2} - \frac{10^2 + 3 \cdot 10}{2}$$

$$= 77 - 65$$

$$= 12$$

(Cevap B)

9.

$$a_2 = 7 \Rightarrow a_1 + d = 7$$

$$\frac{[a_1 + (a_1 + 19d)] \cdot 20}{2} = 180 \Rightarrow 2a_1 + 19d = 18$$

$$2a_1 + 19d = 18$$

$$\begin{array}{r} a_1 + d = 7 \\ - \quad \quad \quad = - \\ \hline a_1 + 18d = 11 \Rightarrow a_{19} = 11 \end{array}$$

(Cevap B)

10.

$$a_9 + a_{10} = S_{10} - S_8$$

$$= (200 + 3) - (128 + 24)$$

$$= 78$$

(Cevap D)

11.

$$\begin{cases} a_1 + 4d = -4 \\ a_1 + 8d = 12 \end{cases} \Rightarrow d = 4 \text{ ve } a_1 = -20$$

$$a_{16} = a_1 + 15d = -20 + 60 = 40 \text{ bulunur.}$$

$$S_{16} = \frac{(-20 + 40) \cdot 16}{2} = 160$$

(Cevap A)

12.

$$\begin{cases} a_1 + 10d = 19 \\ a_1 + 16d = 37 \end{cases} \Rightarrow d = 3 \text{ ve } a_1 = -11$$

$$a_6 = a_1 + 5d = -11 + 15 = 4 \text{ bulunur.}$$

(Cevap C)

13.

$$\frac{(a_1 + a_9) \cdot 9}{2} = 126 \Rightarrow a_1 + a_9 = 28$$

$$\begin{cases} a_9 + a_1 = 28 \\ a_9 + a_1 = 24 \end{cases} \Rightarrow a_9 = 26 \text{ ve } a_1 = 2 \text{ bulunur.}$$

$$a_9 = 26 \Rightarrow a_1 + 8d = 26 \Rightarrow d = 3 \text{ tür.}$$

$$a_1 + a_2 + a_3 = 2 + 5 + 8 = 15 \text{ bulunur.}$$

(Cevap B)

14.

$$\frac{(3 + a_{12}) \cdot 12}{2} - \frac{(3 + a_8) \cdot 4}{2} = 126$$

$$(3 + 3 + 11d) - (3 + 3 + 7d) \cdot 4 = 126$$

$$d = 3 \text{ bulunur.}$$

(Cevap B)

15.

$$\frac{\sin x + \cos x}{2} = \frac{2}{3} \Rightarrow \sin x + \cos x = \frac{4}{3}$$

$$\Rightarrow 1 + \sin x = \frac{16}{9}$$

$$\Rightarrow \sin 2x = \frac{7}{9}$$

(Cevap E)

16.

$$\frac{(a_1 + a_5) \cdot 5}{2} = 360^\circ \Rightarrow a_1 + 112^\circ = 144^\circ$$

$$\Rightarrow a_1 = 32^\circ$$

(Cevap A)

1.

$$a_5 = 32 \Rightarrow a_1 + 4d = 32$$

$$a_{12} = 53 \Rightarrow a_1 + 11d = 53$$

denklemin çözümünden $a_1 = 20$ ve $d = 3$ bulunur.

$$a_{25} = a_1 + 24d = 20 + 24 \cdot 3 = 92 \text{ dir.}$$

(Cevap E)

2.

1, a_2 , a_3 , ..., a_9 , 64

$$a_{10} = 64 \Rightarrow a_1 + 9d = 64$$

$$\Rightarrow 1 + 9d = 64$$

$$\Rightarrow d = 7 \text{ bulunur.}$$

(Cevap D)

3.

$$\frac{(a_1 + a_{15}) + (a_2 + a_{14}) + \dots + (a_7 + a_9) + a_8}{a_8}$$

$$= \frac{2a_8 + 2a_8 + \dots + 2a_8 + a_8}{a_8} = \frac{7 \cdot 2a_8 + a_8}{a_8} = 15$$

(Cevap D)

4.

$$3 + 6 + 9 + \dots + 300 = \frac{(3 + 300) \cdot 100}{2} = 15150$$

(Cevap D)

5.

$$a_1 + a_{15} = 4$$

$$a_2 + a_{14} = 4$$

⋮

⋮

$$a_7 + a_9 = 4$$

$$a_8 = 2$$

toplamları $7 \cdot 4 + 2 = 30$ olur.

(Cevap A)

6.

$$\frac{(a_1 + a_7) \cdot 7}{2} = 63 \Rightarrow a_1 + a_7 = 18$$

$$\Rightarrow 2a_1 + 6d = 18$$

$$\frac{(a_1 + a_{15}) \cdot 15}{2} = 255 \Rightarrow a_1 + a_{15} = 34$$

$$\Rightarrow 2a_1 + 14d = 34$$

$$\left. \begin{array}{l} 2a_1 + 6d = 18 \\ 2a_1 + 14d = 34 \end{array} \right\} \Rightarrow d = 2 \text{ ve } a_1 = 3 \text{ bulunur.}$$

$$S_{10} = \frac{(2a + 9d) \cdot 10}{2} = \frac{(6 + 18) \cdot 10}{2} = 120$$

(Cevap B)

7.

En küçük dış açısının ölçüsü $180^\circ - 70^\circ = 110^\circ$ olur.

$$\frac{(a_1 + a_3) \cdot 3}{2} = 360^\circ \Rightarrow 110^\circ + a_3 = 240$$

$$\Rightarrow a_3 = 130$$

En küçük iç açısının ölçüsü $180^\circ - 130^\circ = 50^\circ$ dir.

(Cevap C)

8.

$$\frac{a_7 + a_{33}}{2} = a_{20} \Rightarrow \frac{(x + 7) + (5x - 3)}{2} = 2x - 1$$

$$\Rightarrow 6x + 4 = 4x - 2$$

$$\Rightarrow x = -3$$

(Cevap B)

9.

$$a_{10} = S_{10} - S_9 \Rightarrow a_{10} = (2 \cdot 10^2 + 10) - (2 \cdot 9^2 + 9) = 39$$

(Cevap C)

10.

$$a_1 = 8, a_9 = 56 \Rightarrow a_1 + 8d = 56$$

$$\Rightarrow 8 + 8d = 56$$

$$\Rightarrow d = 6$$

$$a_5 = a_1 + 4d = 8 + 24 = 32 \text{ dir.}$$

(Cevap E)

11.

$$a_{23} - a_{19} = 12 \Rightarrow (a_1 + 22d) - (a_1 + 18d) = 12$$

$$\Rightarrow d = 3$$

$$a_7 + a_8 + a_9 = 24 \Rightarrow (a_1 + 6d) + (a_1 + 7d) + (a_1 + 8d) = 24$$

$$\Rightarrow 3a_1 + 21d = 24$$

$$\Rightarrow 3a_1 = -39$$

$$\Rightarrow a_1 = -13$$

$$a_{37} = a_1 + 36d = -13 + 108 = 95$$

(Cevap B)

12.

$$\frac{(a_1 + a_8) \cdot 8}{2} = (n-2) \cdot 180^\circ \Rightarrow (110^\circ + a_8) \cdot 4 = 6 \cdot 180^\circ$$

$$\Rightarrow 110^\circ + a_8 = 270^\circ$$

$$\Rightarrow a_8 = 160^\circ$$

(Cevap C)

13.

$$S_{30} = S_{25} + 180 \Rightarrow a_{26} + a_{27} + a_{28} + a_{29} + a_{30} = 180$$

$$\Rightarrow 5 \cdot a_{28} = 180$$

$$\Rightarrow a_{28} = 36$$

$$\left. \begin{array}{l} a_1 + 27d = 36 \\ a + 3d = 4 \end{array} \right\} \Rightarrow a_1 = 0 \text{ ve } d = \frac{4}{3} \text{ bulunur.}$$

$$a_{16} = a_1 + 15d = 15 \cdot \left(\frac{4}{3}\right) = 20$$

(Cevap A)

14.

$$\frac{(5+23) \cdot n}{2} = 140 \Rightarrow n = 10$$

$$a_{10} = 23 \Rightarrow 5 + 9d = 23$$

$$\Rightarrow d = 2 \text{ bulunur.}$$

(Cevap A)

15.

$$\frac{(a_1 + a_2) \cdot 10}{2} = 15 \Rightarrow a_1 + a_{10} = 3$$

$$\frac{(a_1 + a_6) \cdot 6}{2} = 6 \Rightarrow a_1 + a_6 = 2$$

$$a_1 = \frac{3}{8} \text{ ve } d = \frac{1}{4} \text{ bulunur.}$$

$$a_5 = \frac{3}{8} + 4 \cdot \frac{1}{4} = \frac{11}{8} \text{ dir.}$$

(Cevap D)

16.

(a_n) dizisi ortak farkı 3 olan bir aritmetik dizidir.

$$a_{10} = a_1 + 9d = 5 + 9 \cdot 3 = 32 \text{ olur.}$$

$$S_{10} = \frac{(5+32) \cdot 10}{2} = 185 \text{ bulunur.}$$

(Cevap D)

1.

$$\begin{aligned} a_1 + a_2 = 48 &\Rightarrow a_1 + a_1 \cdot r = 48 \Rightarrow a_1(1+r) = 48 \\ a_1 - a_3 = 24 &\Rightarrow a_1 - (a_1 r^2) = 24 \Rightarrow a_1(1-r^2) = 24 \\ a_1(1+r)(1-r) = 24 &\Rightarrow 48 \cdot (1-r) = 24 \Rightarrow r = \frac{1}{2} \end{aligned}$$

(Cevap A)

2.

$$\begin{aligned} &3 + 3 \cdot \frac{1}{3} + 3 \cdot \left(\frac{1}{3}\right)^2 + 3 \cdot \left(\frac{1}{3}\right)^3 + \dots \\ &= 3 \left[1 + \frac{1}{3} + \left(\frac{1}{3}\right)^2 + \left(\frac{1}{3}\right)^3 + \dots \right] = 3 \cdot \frac{1}{1 - \frac{1}{3}} = \frac{9}{2} \end{aligned}$$

(Cevap B)

3.

$$5 \cdot \left[1 + \left(-\frac{2}{3}\right) + \left(-\frac{2}{3}\right)^2 + \dots \right] = 5 \cdot \frac{1}{1 - \left(-\frac{2}{3}\right)} = 3$$

(Cevap B)

4.

$$\begin{aligned} 3 + 3 \cdot 2 + 3 \cdot 2^2 + \dots + 3 \cdot 2^9 &= 3 \cdot (1 + 2 + 2^2 + \dots + 2^9) \\ &= 3 \cdot \frac{1 - 2^{10}}{1 - 2} \\ &= 3 \cdot (2^{10} - 1) \\ &= 3069 \end{aligned}$$

(Cevap B)

5.

$$\begin{aligned} a_8 = 384 &\Rightarrow a_1 \cdot r^7 = 384 \\ &\Rightarrow 3 \cdot r^7 = 384 \\ &\Rightarrow r^7 = 128 \\ &\Rightarrow r = 2 \\ a_5 = 3 \cdot 2^4 &= 48 \text{ bulunur.} \end{aligned}$$

(Cevap A)

6.

10 saat = 20 · (30 dakika)
Ortamda 2^{20} · 250 bakteri olur.

(Cevap C)

7.

$$\begin{aligned} \frac{a_1 \cdot \frac{1-r^6}{1-r}}{a_1 \cdot \frac{1-r^3}{1-r}} = 28 &\Rightarrow 1+r^3 = 28 \\ &\Rightarrow r = 3 \text{ bulunur.} \end{aligned}$$

(Cevap D)

8.

$$\begin{aligned} a_1 \cdot \frac{1-r^8}{1-r} = 17 \cdot a_1 \cdot \frac{1-r^4}{1-r} &\Rightarrow 1+r^4 = 17 \\ &\Rightarrow r^4 = 16 \\ &\Rightarrow r = 2 \end{aligned}$$

(Cevap D)

9.

$$\begin{aligned} h + 2 \cdot h \cdot \frac{3}{2} + 2 \cdot h \cdot \left(\frac{3}{5}\right)^5 + \dots \\ = h + 2h \cdot \frac{3}{5} \cdot \left[1 + \frac{3}{5} + \left(\frac{3}{5}\right)^2 + \dots\right] \\ = h + 2h \cdot \frac{3}{5} \cdot \frac{1}{1 - \frac{3}{5}} \\ = h + 2h \cdot \frac{3}{5} \cdot \frac{5}{2} \\ = 4h \end{aligned}$$

(Cevap C)

10.

$$\begin{aligned} \sum_{n=0}^{\infty} \frac{1}{2^n} &= 1 + \frac{1}{2} + \left(\frac{1}{2}\right)^2 + \left(\frac{1}{2}\right)^3 + \dots \\ &= \frac{1}{1 - \frac{1}{2}} \\ &= 2 \end{aligned}$$

(Cevap E)

11.

$$\begin{aligned} a_5 &= a_1 \cdot 81 \Rightarrow a_1 \cdot r^4 = a_1 \cdot 3^4 \\ &\Rightarrow r = 3 \\ a_{11} &= a_{10} \cdot r \Rightarrow a_{11} = 45 \cdot 3 \\ &\Rightarrow a_{11} = 135 \end{aligned}$$

(Cevap B)

12.

$$\begin{aligned} \sum_{n=0}^{\infty} \frac{1+2^{n-1}}{3^{n-1}} &= \sum_{n=0}^{\infty} \frac{1}{3^{n-1}} + \sum_{n=0}^{\infty} \left(\frac{2}{3}\right)^{n-1} \\ &= \left[3 + 1 + \frac{1}{3} + \left(\frac{1}{3}\right)^2 + \dots\right] + \left[\frac{3}{2} + 1 + \frac{2}{3} + \left(\frac{2}{3}\right)^2 + \dots\right] \\ 3 + \frac{1}{1 - \frac{1}{3}} + \frac{3}{2} + \frac{1}{1 - \frac{2}{3}} &= 9 \end{aligned}$$

(Cevap B)

13.

$$\begin{aligned} a_1 \cdot r^4 + a_1 \cdot r^7 &= 108 \Rightarrow a_1 \cdot r^4 (1 + r^3) = 108 \\ a_1 \cdot r^2 + a_1 \cdot r^5 &= 27 \Rightarrow a_1 \cdot r^2 (1 + r^3) = 27 \\ r^2 = 4 &\Rightarrow r = 2 \text{ bulunur.} \\ a_1 \cdot r^2 (1 + r^3) &= 27 \Rightarrow a_1 \cdot 4(1 + 8) = 27 \\ &\Rightarrow a_1 = \frac{3}{4} \text{ elde edilir.} \end{aligned}$$

(Cevap C)

14.

$$\begin{aligned} \left(\frac{2}{3}\right)^k + \left(\frac{2}{3}\right)^{k+1} + \left(\frac{2}{3}\right)^{k+2} + \dots &= \frac{16}{27} \\ \left(\frac{2}{3}\right)^k \cdot \left[1 + \frac{2}{3} + \left(\frac{2}{3}\right)^2 + \dots\right] &= \frac{16}{27} \\ \left(\frac{2}{3}\right)^k \cdot \frac{1}{1 - \frac{2}{3}} &= \frac{16}{27} \Rightarrow \left(\frac{2}{3}\right)^k = \frac{16}{81} \\ &\Rightarrow k = 4 \end{aligned}$$

(Cevap B)

15.

$$\begin{aligned} 4 + 4 \cdot \frac{1}{2} + 4 \cdot \left(\frac{1}{2}\right)^2 + 4 \cdot \left(\frac{1}{2}\right)^3 + \dots &= 4 \left(1 + \frac{1}{2} + \left(\frac{1}{2}\right)^2 + \left(\frac{1}{2}\right)^3 + \dots\right) \\ &= 4 \cdot \frac{1}{1 - \frac{1}{2}} \\ &= 8m^2 \end{aligned}$$

elde edilir.

(Cevap B)

16.

$$\begin{aligned} S &= \frac{1}{4} + \frac{2}{4^2} + \frac{3}{4^3} + \dots \text{ ①} \\ \frac{1}{4} \cdot S &= \frac{1}{4^2} + \frac{2}{4^3} + \frac{3}{4^4} + \dots \text{ ②} \\ \text{① ve ② taraf tarafa çıkarılırsa,} \\ S - \frac{1}{4}S &= \frac{1}{4} + \frac{1}{4^2} + \frac{1}{4^3} + \dots \Rightarrow \frac{3}{4}S = \frac{1}{4} \cdot \frac{1}{1 - \frac{1}{4}} \\ &\Rightarrow S = \frac{4}{9} \text{ elde edilir.} \end{aligned}$$

(Cevap A)

1.

$$\sqrt{a_5 \cdot a_{11}} = a_8 \Rightarrow 80 \cdot a_{11} = 640^2$$

$$\Rightarrow a_{11} = 5120$$

(Cevap E)

2.

$$\left. \begin{array}{l} a_3 = 4 \Rightarrow a_1 \cdot r^2 = 4 \\ a_7 = 36 \Rightarrow a_1 \cdot r^6 = 36 \end{array} \right\} \Rightarrow \frac{1}{r^4} = \frac{1}{9}$$

$$\Rightarrow r = \sqrt{3}$$

$$a_3 = 4 \Rightarrow a_1 \cdot r^2 = 4$$

$$\Rightarrow a_1 = \frac{4}{3}$$

$$a_{10} = a_1 \cdot r^9 = \frac{4}{3} \cdot (\sqrt{3})^9 = 108\sqrt{3}$$

(Cevap D)

3.

$$\frac{a_1 \cdot r^6}{a_1 \cdot r^3} = \frac{54}{-2} \Rightarrow r^3 = -27$$

$$\Rightarrow r = -3 \text{ tür.}$$

$$a_1 \cdot r^3 = -2 \Rightarrow a_1 \cdot (-27) = -2$$

$$\Rightarrow a_1 = \frac{2}{27} \text{ bulunur.}$$

$$a_n = \frac{2}{27} \cdot (-3)^{n-1} \text{ dir.}$$

(Cevap A)

4.

$$a_1 \cdot a_2 \cdot a_3 = \frac{1}{8} \Rightarrow a_1 \cdot (a_1 \cdot r) \cdot 1 = \frac{1}{8}$$

$$\left. \begin{array}{l} \Rightarrow a_1^2 \cdot r = \frac{1}{8} \\ a_3 = 1 \Rightarrow a_1 \cdot r^2 = 1 \end{array} \right\} \Rightarrow a_1^3 \cdot r^3 = \frac{1}{8}$$

$$\Rightarrow a_1 \cdot r = \frac{1}{2}$$

$$a_1 r^2 = 1 \Rightarrow (a_1 \cdot r) \cdot r = 1$$

$$\Rightarrow \frac{1}{2} \cdot r = 1 \Rightarrow r = 2 \text{ ve } a_1 = \frac{1}{4}$$

$$a_{10} = a_1 \cdot r^9 = \frac{1}{4} \cdot 2^9 = 2^7 = 128$$

(Cevap D)

5.

$$a_1 \cdot r^5 + a_1 \cdot r^6 = 6 \cdot a_1 \cdot r^4 \Rightarrow r^5 + r^6 = 6r^4$$

$$\Rightarrow r^2 + r - 6 = 0$$

$$\Rightarrow (r+3)(r-2) = 0$$

$$\Rightarrow r = -3 \text{ veya } r = 2$$

(Cevap D)

6.

$$20 + 2 \cdot 20 \cdot \frac{4}{5} + 2 \cdot 20 \cdot \left(\frac{4}{5}\right)^2 + 2 \cdot 20 \cdot \left(\frac{4}{5}\right)^3 + \dots$$

$$= 20 + 2 \cdot 20 \cdot \frac{4}{5} \left(1 + \left(\frac{4}{5}\right) + \left(\frac{4}{5}\right)^2 + \dots\right)$$

$$= 20 + 32 \cdot \frac{1}{1 - \frac{4}{5}}$$

$$= 20 + 32 \cdot 5$$

$$= 180 \text{ m}$$

(Cevap D)

7.

$$a_5 : a_2 = \left(1 + \frac{1}{3} + \frac{1}{3^2} + \frac{1}{3^3} + \frac{1}{3^4} + \frac{1}{3^5}\right) \cdot \left(1 + \frac{1}{3} + \frac{1}{3^2}\right)$$

$$= \frac{1 - \frac{1}{3^6}}{1 - \frac{1}{3}} \cdot \frac{1 - \frac{1}{3^3}}{1 - \frac{1}{3}}$$

$$= \frac{3^6 - 1}{3^6} \cdot \frac{3^3 - 1}{3^3}$$

$$= \frac{(3^3 - 1)(3^3 + 1)}{3^6} \cdot \frac{3^3}{3^3 - 1}$$

$$= \frac{28}{27} \text{ bulunur.}$$

(Cevap A)

8.

$$\sum_{n=3}^{\infty} 2^{1-n} = \sum_{n=3}^{\infty} \frac{1}{2^{n-1}}$$

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

$$= \frac{1}{2^2} \cdot \left[1 + \frac{1}{2} + \left(\frac{1}{2}\right)^2 + \dots\right]$$

$$= \frac{1}{4} \cdot \frac{1}{1 - \frac{1}{2}} = \frac{1}{2}$$

(Cevap A)

9.

$$\begin{aligned} \frac{2^2}{3} + \frac{2^3}{3^2} + \frac{2^4}{3^3} + \dots &= \frac{2^2}{3} \left[1 + \frac{2}{3} + \left(\frac{2}{3}\right)^2 + \dots \right] \\ &= \frac{4}{3} \cdot \frac{1}{1 - \frac{2}{3}} = 4 \end{aligned}$$

(Cevap C)

10.

$$\begin{aligned} x &= \sqrt{\cos 75^\circ \cdot \cos 15^\circ} \\ x &= \sqrt{\frac{1}{2} [\cos(75^\circ + 15^\circ) + \cos(75^\circ - 15^\circ)]} \\ x &= \sqrt{\frac{1}{2} [\cos 90^\circ + \cos 60^\circ]} \\ x &= \sqrt{\frac{1}{2} \cdot \frac{1}{2}} \Rightarrow x = \frac{1}{2} \end{aligned}$$

(Cevap C)

11.

$$\begin{aligned} &4 \left[a + a \cdot \frac{\sqrt{2}}{2} + a \cdot \left(\frac{\sqrt{2}}{2}\right)^2 + a \cdot \left(\frac{\sqrt{2}}{2}\right)^3 + \dots \right] \\ &= 4a \left[1 + \frac{\sqrt{2}}{2} + \left(\frac{\sqrt{2}}{2}\right)^2 + \left(\frac{\sqrt{2}}{2}\right)^3 + \dots \right] \\ &= 4a \cdot \frac{1}{1 - \frac{\sqrt{2}}{2}} = 4a \cdot \frac{2}{2 - \sqrt{2}} = 4a(2 + \sqrt{2}) \end{aligned}$$

(Cevap A)

12.

$$\begin{aligned} \left(-\frac{3}{4}\right)^0 + \left(-\frac{3}{4}\right)^1 + \left(-\frac{3}{4}\right)^2 + \dots &= \frac{1}{1 - \left(-\frac{3}{4}\right)} \\ &= \frac{4}{7} \end{aligned}$$

(Cevap C)

13.

$$\begin{aligned} &\left(-\frac{2}{3}\right)^2 + \left(-\frac{2}{3}\right)^3 + \left(-\frac{2}{3}\right)^4 + \dots \\ &= \left(-\frac{2}{3}\right)^2 \left[1 + \left(-\frac{2}{3}\right) + \left(-\frac{2}{3}\right)^2 + \dots \right] \\ &= \frac{4}{9} \cdot \frac{1}{1 - \left(-\frac{2}{3}\right)} = \frac{4}{9} \cdot \frac{3}{5} = \frac{4}{15} \end{aligned}$$

(Cevap A)

14.

Boyanacak üçgen sayısı 1. adımda 1, 2. adımda 3, 3. adımda 9, ... olduğundan

$$(a_n) = (3^{n-1}) \text{ olur.}$$

(Cevap B)

15.

$$b_1 = 4 \cdot \frac{1}{4} = 1, \quad b_2 = 3 \cdot 4 \cdot \frac{1}{4} \cdot \frac{1}{4} = 4 \cdot \frac{1}{4} \cdot \left(\frac{3}{4}\right) = \frac{3}{4}$$

$$b_3 = 9 \cdot 4 \cdot \frac{1}{4} \cdot \frac{1}{4} \cdot \frac{1}{4} = 4 \cdot \frac{1}{4} \cdot \left(\frac{3}{4}\right)^2 = \left(\frac{3}{4}\right)^2 \dots$$

$$\text{olacağından } b_n = \left(\frac{3}{4}\right)^{n-1} \text{ elde edilir.}$$

(Cevap C)

16.

$$b_1 + b_2 + b_3 + \dots + b_n = 1 + \frac{3}{4} + \left(\frac{3}{4}\right)^2 + \dots + \left(\frac{3}{4}\right)^{n-1}$$

$$= \frac{1 - \left(\frac{3}{4}\right)^n}{1 - \frac{3}{4}}$$

$$= 4 \cdot \left[1 - \left(\frac{3}{4}\right)^n \right] \text{ birimkare olur.}$$

(Cevap D)

1.

$$r = \frac{a_3}{a_2} = \frac{18}{6} = 3 \text{ tür, } a_2 = a_1 r \Rightarrow 6 = a_1 \cdot 3$$

$$\Rightarrow a_1 = 2 \text{ olur.}$$

$$a_5 = a_1 \cdot r^4 = 2 \cdot 3^4 = 162 \text{ bulunur.}$$

(Cevap D)

2.

$$2\pi \cdot 8 + 2\pi \cdot 4 + 2\pi \cdot 2 + 2\pi \cdot 1 + \dots$$

$$= 16\pi + 8\pi + 4\pi + 2\pi + \dots$$

$$= 16\pi \left[1 + \frac{1}{2} + \left(\frac{1}{2}\right)^2 + \left(\frac{1}{2}\right)^3 + \dots \right]$$

$$= 16\pi \cdot \frac{1}{1 - \frac{1}{2}} = 32\pi \text{ birim bulunur.}$$

(Cevap C)

3.

$$\frac{a_{n+1}}{a_n} = \frac{3^{n+1} \cdot (n+1)!}{3^n \cdot n!} = 3(n+1)$$

(Cevap C)

4.

$$\frac{(a_1 + a_4) \cdot 4}{2} = 360^\circ \Rightarrow 50^\circ + a_4 = 180^\circ$$

$$\Rightarrow a_4 = 130^\circ$$

(Cevap E)

5.

$$1 + 4 + 7 + \dots + 58 = \frac{(1 + 58) \cdot 20}{2}$$

$$= 590$$

(Cevap B)

6.

$$\frac{(2^8 + 1) - (2^6 + 1)}{(2^7 - 1) - (2^5 - 1)} = \frac{2^8 - 2^6}{2^7 - 2^5} = \frac{2^6 \cdot (2^2 - 1)}{2^5 \cdot (2^2 - 1)} = 2$$

(Cevap A)

7.

$$a_1 = 3, a_6 = 96 \Rightarrow a_1 \cdot r^5 = 96$$

$$\Rightarrow 3 \cdot r^5 = 96$$

$$\Rightarrow r = 2 \text{ bulunur.}$$

$$a_2 + a_3 + a_4 + a_5 = 3 \cdot 2 + 3 \cdot 2^2 + 3 \cdot 2^3 + 3 \cdot 2^4$$

$$= 90$$

(Cevap C)

8.

$$\frac{1}{2} \cdot 2 \cdot \frac{1}{3} + \frac{1}{2} \cdot 2 \cdot \frac{1}{3^2} + \frac{1}{2} \cdot 2 \cdot \frac{1}{3^3} + \dots$$

$$= \frac{1}{3} \left[1 + \frac{1}{9} + \frac{1}{9^2} + \dots \right] = \frac{1}{3} \cdot \frac{1}{1 - \frac{1}{9}} = \frac{3}{8}$$

(Cevap A)

9.

$$\left(-\frac{2}{3}\right)^0 + \left(-\frac{2}{3}\right)^1 + \left(-\frac{2}{3}\right)^2 + \dots = \frac{1}{1 - \left(-\frac{2}{3}\right)} = \frac{3}{5}$$

10.

$$\begin{aligned} A_1 + A_2 + A_3 + \dots &= \left(\frac{8}{2}\right)^2 + \left(\frac{8}{2}\right)^2 \cdot \frac{1}{4} + \left(\frac{8}{2}\right)^2 \cdot \left(\frac{1}{4}\right)^2 + \dots \\ &= 16 \left[1 + \frac{1}{4} + \left(\frac{1}{4}\right)^2 + \dots \right] = 16 \cdot \frac{1}{1 - \frac{1}{4}} = \frac{64}{3} \end{aligned}$$

11.

$$\begin{aligned} \frac{2}{n(n+1)} &= \frac{2}{n} - \frac{2}{n+1} \\ \left(\frac{2}{1} - \frac{2}{2}\right) + \left(\frac{2}{2} - \frac{2}{3}\right) + \dots + \left(\frac{2}{15} - \frac{2}{16}\right) \\ &= \left(\frac{2}{1} + \frac{2}{2} + \frac{2}{3} + \dots + \frac{2}{15}\right) - \left(\frac{2}{2} + \frac{2}{3} + \dots + \frac{2}{16}\right) \\ &= \frac{2}{1} - \frac{2}{16} = \frac{15}{8} \end{aligned}$$

12.

$$\begin{aligned} \frac{a_1 r^6 - a_1}{(a_1 r^3)^2 - (a_1)^2} &= \frac{1}{3} \Rightarrow \frac{a_1 (r^6 - 1)}{a_1^2 r^6 - a_1^2} = \frac{1}{3} \\ &\Rightarrow \frac{1}{a_1} = \frac{1}{3} \\ &\Rightarrow a_1 = 3 \end{aligned}$$

$$a_3 = 12 \Rightarrow a_1 \cdot r^2 = 12 \Rightarrow r^2 = 4$$

$$a_5 = a_1 \cdot r^4 = 3 \cdot 4^2 = 48 \text{ bulunur.}$$

13.

$$\begin{aligned} n = 8 \text{ için } a_{10} &= a_9 + a_8 \\ n = 7 \text{ için } a_{11} &= a_{10} + a_9 \\ \frac{a_{10} - a_{11}}{2} &= \frac{a_9 + a_8 - a_{10} - a_9}{2} \\ 2 \cdot a_{10} &= a_8 + a_{11} \\ 16 &= a_8 + a_{11} \end{aligned}$$

14.

$$\frac{\frac{n(n+1)(2n+1)}{6}}{\frac{n(n+1)}{2}} = 9 \Rightarrow \frac{2n+1}{3} = 9 \Rightarrow n = 13$$

15.

$$\begin{aligned} |A_1 B_1| + |A_2 B_2| + |A_3 B_3| &= 24 \cdot 24 \cdot \frac{3}{4} + 24 \cdot \left(\frac{3}{4}\right)^2 \\ &= 24 \cdot \left[1 + \frac{3}{4} + \left(\frac{3}{4}\right)^2 + \dots \right] = 96 \end{aligned}$$

16.

$$\begin{aligned} \sqrt{(x-2) \cdot 6x} &= 2x \Rightarrow (x-2) \cdot 6x = 4x^2 \\ &\Rightarrow (x-2) \cdot 6 = 4x \\ &\Rightarrow x = 6 \text{ bulunur.} \end{aligned}$$

(Cevap D)

(Cevap D)

(Cevap E)

(Cevap 48)

(Cevap 16)

(Cevap E)

(Cevap E)

(Cevap 6)