

$$\begin{aligned}
 1. \quad & \frac{\left(\frac{2}{1} - \frac{2}{3}\right)\left(\frac{1}{1} + \frac{1}{3}\right)}{\left(\frac{3}{3}\right)\left(\frac{1}{1}\right)\left(\frac{3}{3}\right)\left(\frac{1}{1}\right)} = \frac{6-2}{3} \cdot \frac{3+1}{3} \\
 & \frac{\left(\frac{2}{1} - \frac{1}{3}\right)\left(\frac{2}{1} + \frac{1}{3}\right)}{\left(\frac{3}{3}\right)\left(\frac{1}{1}\right)\left(\frac{3}{3}\right)\left(\frac{1}{1}\right)} = \frac{6-1}{3} \cdot \frac{6+1}{3} \\
 & = \frac{4}{3} \cdot \frac{4}{3} \\
 & = \frac{5}{3} \cdot \frac{7}{3} \\
 & = \frac{16}{9} \\
 & = \frac{16}{9} \cdot \frac{9}{35} \\
 & = \frac{16}{35}
 \end{aligned}$$

Cevap: C

$$\begin{aligned}
 2. \quad & 1 - \frac{3}{4 - \frac{1}{1 - \frac{1}{2}}} = 1 - \frac{3}{4 - \frac{1}{\frac{1}{2}}} = 1 - \frac{3}{4-2} \\
 & = 1 - \frac{3}{2} \\
 & = \frac{2-3}{2} \\
 & = -\frac{1}{2}
 \end{aligned}$$

Cevap: C

$$\begin{aligned}
 3. \quad & 10 - \frac{19}{5 - \frac{9}{x + \frac{1}{2}}} = \frac{1}{2} \Rightarrow \frac{19}{5 - \frac{9}{x + \frac{1}{2}}} = 10 - \frac{1}{2} \\
 & \frac{19}{5 - \frac{9}{x + \frac{1}{2}}} = \frac{19}{2} \\
 & 5 - \frac{9}{x + \frac{1}{2}} = 2 \\
 & \frac{9}{x + \frac{1}{2}} = 3 \\
 & x + \frac{1}{2} = 3 \\
 & \Rightarrow x = 3 - \frac{1}{2} = \frac{5}{2} \\
 & \Rightarrow 2x - 1 = 2 \cdot \frac{5}{2} - 1 = 5 - 1 = 4
 \end{aligned}$$

Cevap: D

$$\begin{aligned}
 4. \quad & \frac{3}{1 - \frac{1}{3}} - 3 - \frac{1}{3} = \frac{3}{\frac{2}{3}} - 3 - \frac{1}{3} \\
 & = 3 \cdot \frac{3}{2} - 3 - \frac{1}{3} \cdot \frac{1}{3} \\
 & = \frac{9}{2} - \frac{3}{1} - \frac{1}{9} \\
 & = \frac{81 - 54 - 2}{18} \\
 & = \frac{25}{18}
 \end{aligned}$$

Cevap: B

$$5. \quad \begin{array}{c} | \quad | \quad | \\ \frac{7}{2} \quad \# \quad x \quad \# \quad \frac{21}{5} \end{array}$$

$\frac{7}{2}$ ve $\frac{21}{5}$ sayılarına eşit uzaklıkta olan sayımız x olsun.
x tam ortadadır. Yani x sayısı verilen sayıların aritmetik ortalamasıdır.

$$x = \frac{\frac{7}{2} + \frac{21}{5}}{2} = \frac{\frac{35+42}{10}}{2} = \frac{77}{10} \cdot \frac{1}{2} = \frac{77}{20}$$

Cevap: A

$$6. \quad \left(\frac{3-\frac{3}{5}}{2+\frac{1}{3}} \right) \cdot \left(\frac{4-\frac{1}{2}}{6-\frac{6}{5}} \right) = \frac{15-3}{6+1} \cdot \frac{8-1}{30-6} = \frac{12}{7} \cdot \frac{7}{24} = \frac{3}{4}$$

Cevap: C

$$7. \quad \begin{array}{l} \frac{4}{5} + \frac{5}{8} + \frac{8}{11} = x \Rightarrow \frac{1}{5} + \frac{11}{8} + \frac{3}{11} = ? \\ + \frac{1}{5} + \frac{11}{8} + \frac{3}{11} = y \end{array}$$

$$\frac{5}{5} + \frac{16}{8} + \frac{11}{11} = x + y$$

$$1 + 2 + 1 = x + y$$

$$4 = x + y \Rightarrow y = 4 - x$$

Cevap: B

$$8. \quad \left(3 - \frac{1}{3 - \frac{2}{3}} \right) \cdot \left(2 + \frac{2 + \frac{2}{3}}{8} \right) = \left(3 - \frac{1}{\frac{7}{3}} \right) \cdot \left(2 + \frac{\frac{8}{3}}{8} \right) = \left(3 - 1 \cdot \frac{3}{7} \right) \cdot \left(2 + \frac{8}{3} \cdot \frac{1}{8} \right) = \left(3 - \frac{3}{7} \right) \cdot \left(2 + \frac{1}{3} \right) = \frac{18}{7} \cdot \frac{7}{3} = 6$$

Cevap: D

$$9. \quad \frac{4 + \left(\frac{3}{19} - \frac{35}{17} \right)}{1 + \frac{22}{19} - \frac{1}{17}} = \frac{4 + \left(\frac{22}{19} - \frac{19}{19} \right) - \left(\frac{34}{17} - \frac{1}{17} \right)}{1 + \frac{22}{19} - \frac{1}{17}} = \frac{4 + \frac{22}{19} - 1 - 2 - \frac{1}{17}}{1 + \frac{22}{19} - \frac{1}{17}} = \frac{1 + \frac{22}{19} - \frac{1}{17}}{1 + \frac{22}{19} - \frac{1}{17}} = 1$$

Cevap: B

$$10. \quad 2 - \frac{\left(\frac{1}{2} - 1 \right) : \frac{1}{2}}{\left(\frac{1}{3} - 1 \right) : \frac{2}{3}} = 2 - \frac{\left(\frac{1-2}{2} \right) : \frac{1}{2}}{\left(\frac{1-3}{3} \right) : \frac{2}{3}} = 2 - \frac{-\frac{1}{2} : \frac{1}{2}}{-\frac{2}{3} : \frac{2}{3}} = 2 - \frac{-1}{-1} = 2 - 1 = 1$$

Cevap: C

$$\begin{aligned}
 11. \quad \frac{4}{1 + \frac{15}{1 + \frac{28}{x-6}}} = 2 &\Rightarrow 1 + \frac{15}{1 + \frac{28}{x-6}} = 2 \\
 &\Rightarrow \frac{15}{1 + \frac{28}{x-6}} = 1 \\
 &\Rightarrow 1 + \frac{28}{x-6} = 15 \\
 &\Rightarrow \frac{28}{x-6} = 14 \\
 &\Rightarrow x - 6 = 2 \\
 &\Rightarrow x = 2 + 6 = 8
 \end{aligned}$$

Cevap: E

$$\begin{aligned}
 12. \quad \left(\frac{1}{2} - \frac{2}{3}\right) - \left[\left(2 \cdot \frac{1}{4}\right) \cdot \frac{1}{4} - \frac{5}{6}\right] \\
 = \left(\frac{3-4}{6}\right) - \left(2 \cdot \frac{1}{4} \cdot \frac{1}{4} - \frac{5}{6}\right) \\
 = -\frac{1}{6} - \left(2 - \frac{5}{6}\right) \\
 = -\frac{1}{6} - \left(\frac{12-5}{6}\right) \\
 = -\frac{1}{6} - \frac{7}{6} = -\frac{8}{6} = -\frac{4}{3}
 \end{aligned}$$

Cevap: A

$$\begin{aligned}
 13. \quad \frac{4}{1 + \frac{15}{1 + \frac{4}{x-6}}} = -1 &\Rightarrow 1 + \frac{15}{1 + \frac{4}{x-6}} = -4 \\
 &\Rightarrow \frac{15}{1 + \frac{4}{x-6}} = -5 \\
 &\Rightarrow 1 + \frac{4}{x-6} = -3 \\
 &\Rightarrow \frac{4}{x-6} = -4 \\
 &\Rightarrow x - 6 = -1 \\
 &\Rightarrow x = -1 + 6 = 5
 \end{aligned}$$

Cevap: E

$$14. \quad 4 - \frac{4}{4 - \frac{4}{4 - \frac{4}{x}}} = x \text{ olsun.}$$

$$\Rightarrow 4 - \frac{4}{x} = x \Rightarrow \frac{x}{1} + \frac{4}{x} - \frac{4}{1} = 0$$

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

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

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

$$x - 2 = 0 \Rightarrow x = 2$$

Cevap: C

$$\begin{aligned}
 15. \quad \frac{\frac{2018}{2020} - \left(\frac{2}{2019} - \frac{1}{1010}\right)}{\frac{2017}{2019}} \\
 = \frac{\frac{2018}{2020} - \frac{2}{2019} + \frac{1}{1010}}{\frac{2017}{2019}} \\
 = \frac{\frac{2018+2}{2020} - \frac{2}{2019}}{\frac{2017}{2019}} \\
 = \frac{1 - \frac{2}{2019}}{\frac{2017}{2019}} = \frac{2017}{2017} = 1
 \end{aligned}$$

Cevap: D

$$16. \frac{9}{8 + \frac{9}{8 + \frac{9}{\vdots}}} = x \text{ olsun.} \Rightarrow \frac{9}{8+x} = x \Rightarrow \boxed{x=1}$$

$$16 - \frac{64}{16 - \frac{64}{\vdots}} = y \text{ olsun} \Rightarrow 16 - \frac{64}{y} = y \Rightarrow \boxed{y=8}$$

$$\Rightarrow \frac{9}{8 + \frac{9}{8 + \frac{9}{\vdots}}} - \frac{8}{16 - \frac{64}{16 - \frac{64}{\vdots}}} = x - \frac{8}{y}$$

$$= 1 - \frac{8}{8} = 1 - 1 = \boxed{0}$$

Cevap: C

$$17. \left(1 - \frac{1}{2^2}\right) \cdot \left(1 - \frac{1}{3^2}\right) \cdot \left(1 - \frac{1}{4^2}\right) \cdots \left(1 - \frac{1}{10^2}\right)$$

$$= \left(1 - \frac{1}{2}\right) \cdot \left(1 + \frac{1}{2}\right) \cdot \left(1 - \frac{1}{3}\right) \cdot \left(1 + \frac{1}{3}\right) \cdot \left(1 - \frac{1}{4}\right) \cdot \left(1 + \frac{1}{4}\right) \cdots$$

$$\cdot \left(1 - \frac{1}{10}\right) \cdot \left(1 + \frac{1}{10}\right)$$

$$= \frac{1}{2} \cdot \frac{\cancel{2}}{\cancel{2}} \cdot \frac{\cancel{2}}{\cancel{3}} \cdot \frac{\cancel{4}}{\cancel{3}} \cdot \frac{\cancel{3}}{\cancel{4}} \cdot \frac{\cancel{5}}{\cancel{4}} \cdots \frac{\cancel{9}}{\cancel{10}} \cdot \frac{11}{10} = \frac{1}{2} \cdot \frac{11}{10} = \frac{11}{20}$$

Cevap: C

$$18. \left((3^{-1} + 4^{-1}) + \left(\frac{12}{5}\right)^{-1}\right)^2 = \left(\frac{1}{3} + \frac{1}{4} + \frac{5}{12}\right)^2$$

$$= \left(\frac{4+3+5}{12}\right)^2$$

$$= \left(\frac{12}{12}\right)^2$$

$$= 1^2$$

$$= 1$$

Cevap: E

$$19. \left(\left(-\frac{2}{5}\right)^{-2}\right)^3 \cdot \left(\left(\frac{5}{2}\right)^3\right)^{-2} = \left(\left(-\frac{5}{2}\right)^2\right)^3 \cdot \left(\left(\frac{5}{2}\right)^3\right)^{-2}$$

$$= \left(\frac{5}{2}\right)^6 \cdot \left(\frac{5}{2}\right)^{-6}$$

$$= \left(\frac{5}{2}\right)^{6-6}$$

$$= \left(\frac{5}{2}\right)^0$$

$$= 1$$

Cevap: B

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

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

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

Cevap: B