

پاسخ نمونه سوالات ریاضی نهم (تیزهوشان)

(۱)

$$B = \left\{ \frac{x+1}{2x} \mid x \in N, x \leq 5 \right\} = \left\{ 1, \frac{3}{4}, \frac{2}{3}, \frac{5}{8}, \frac{3}{5} \right\}$$

(۲)

$$\{ 7, 77, 777, 7777, \dots \} = \left\{ 7 \times \frac{10^x - 1}{9} \mid x \in N \right\}$$

(۳)

$$255 + 1 = 256 = 2^8 \rightarrow n = 8$$

$$\text{تعداد زیر مجموعه های دو عضوی} = \frac{n(n-1)}{2} = \frac{8 \times 7}{2} = 28$$

(۴)

$$\left\{ \frac{3^{x-1}}{9^{2y}} \mid 4y - x = 3 \right\} = \frac{3^{x-1}}{3^{4y}} = 3^{x-4y-1} = 3^{-3-1} = 3^{-4} = \frac{1}{81}$$

(۵)

$$|3 - \sqrt{3}| - |1 - \sqrt{3}| + 3\sqrt{3} = 3 - \sqrt{3} + 1 - \sqrt{3} + 3\sqrt{3} = 4 + \sqrt{3}$$

دقت شود، مبدأ را ۴ در نظر بگیرید.

(۶)

$$A = \frac{1}{2} + \frac{1}{2^2} + \frac{1}{2^3} + \dots + \frac{1}{2^{1395}}$$

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$$2A = 1 + \frac{1}{2} + \frac{1}{2^2} + \dots + \frac{1}{2^{1394}}$$

$$A = 1 - \frac{1}{2^{1395}} \Rightarrow A = \frac{2^{1395} - 1}{2^{1395}}$$

(۷)

$$\sqrt[3]{ab} = \frac{a}{11}$$

$$\frac{3b}{99} = \frac{a}{11} \rightarrow \frac{3b}{9} = a \rightarrow 3b = 9 \times a$$

$$b = 6, a = 4 \rightarrow a + b = 10$$

(۸)

$$\frac{3}{2 \times 4} + \frac{3}{4 \times 6} + \dots + \frac{3}{98 \times 100} = \frac{3}{2} \left(\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \dots + \frac{1}{49 \times 50} \right) = \frac{3}{2} \left(\frac{1}{1} - \frac{1}{2} + \frac{1}{2} - \frac{1}{3} + \dots + \frac{1}{49} - \frac{1}{50} \right) =$$

$$\frac{3}{2} \left(\frac{1}{1} - \frac{1}{50} \right) = \frac{3}{2} \times \frac{49}{50} = \frac{147}{100}$$

$$\begin{array}{r} 0.\overline{2222} \dots \\ + \\ \frac{1}{3}\overline{111} \dots \\ \hline \frac{1}{5}\overline{333} \dots \end{array} \rightarrow \frac{1}{3\overline{3}}$$

$$\frac{-1}{2} + \frac{1}{2} \times \frac{1}{3} \div \frac{1}{6} + \frac{1}{4} = \frac{-1}{2} + \frac{1}{6} \times 6 + \frac{1}{4} = \left(-\frac{1}{2}\right) + 1 + \frac{1}{4} = \frac{-1+2}{2} + \frac{1}{4} = \frac{1}{2} + \frac{1}{4} = \frac{3}{4}$$

دنیای ریاضیات استاد عشقی

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