



تدریس خصوصی ریاضی به صورت حضوری در تهران و آنلاین در سراسر دنیا با بهترین دبیران در مدرسه

۷۷۱۸۱۳۹۹ - ۷۷۱۸۱۳۳۶ - ۶۶۷۱۳۴۷۲ - ۶۶۵۷۵۹۵۱ - ۸۸۹۰۶۹۰۹ - ۸۸۹۰۴۰۰۲

کد تهران ۰۲۱

$$A = [x - 2, +\infty) \cap (-\infty, 2x - 1]$$

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حل:

$$x > -2 \rightarrow 2x - 1 > x - 2$$

$$\Rightarrow \frac{(x - 2) + (2x - 1)}{2} = \frac{3}{2} \rightarrow 2x - 4 = 3 \rightarrow x = \frac{7}{2}$$

$$M = \{1, 2, 3, \dots, 20, 21\}, A = \{2, 3, 5, 7, 11, 13, 17, 19\}$$

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$$B = \{2, 4, 6, 8, \dots, 18, 20\} \quad C = A \cup B \Rightarrow$$

حل:

$$C = \{2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20\}$$

$$C' = \{1, 9, 15, 21\}$$

$$n(M) = 22$$

$$n(M) - n(A \cup B) = 5 \rightarrow 22 - n(A \cup B) = 5$$

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$$n(A) = 18 \text{ چای}$$

$$\Rightarrow n(A \cup B) = 17$$

حل:

$$n(B) = 17 \text{ قهوه}$$

$$n(A \cup B) = n(A) + n(B) - n(A \cap B)$$

$$\rightarrow 17 = 18 + 17 - n(A \cap B) \rightarrow n(A \cap B) = 18$$

$$n(A) - n(A \cap B) = 18 - 18 = 0 \text{ نفر}$$

$$-\frac{1}{2}, \frac{4}{5}, -\frac{7}{10}, \frac{10}{17}, -\frac{13}{26}, \dots$$

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حل:

$$\text{صورت دنباله حسابی: } 1 + 3(n - 1) = 3n - 2$$

$$\text{مخرج: } n^2 + 1$$

$$\Rightarrow a_n = (-1)^n \times \frac{3n - 2}{n^2 + 1}$$

$$a_1 = 5$$

$$\Rightarrow a_n = 5 + 7 + 10 + 13 + \dots + (3n + 1)$$

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$$a_2 = 5 + 7$$

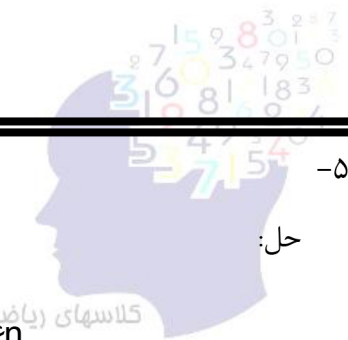
حل:

$$a_3 = 5 + 7 + 10$$

$$a_4 = 5 + 7 + 10 + 13$$

$$\Rightarrow a_n = \frac{n \times [5 + (3n + 1)]}{2} \Rightarrow a_n = \frac{3n^2 + 6n}{2}$$

$$a_5 = 5 + 7 + 10 + 13 + 16$$



کلاسهای ریاضی مقدماتی

$$a_{r_{n+1}} = 2n^2 - n + 1 \Rightarrow a_t = 2\left(\frac{t-1}{2}\right)^2 - \left(\frac{t-1}{2}\right) + 1$$

فرض: $2n+1=t \rightarrow n=\frac{t-1}{2}$ حل: -۶

$$\Rightarrow a_t = \frac{2t^2 - 2t + 2 - t + 1}{2} + 1 \Rightarrow a_t = t^2 - \frac{5}{2}t + \frac{5}{2}$$

$$\Rightarrow a_n = n^2 - \frac{5}{2}n + \frac{5}{2}$$

$$d = \frac{22 - (-7)}{5 + 1} = 5$$

حل: -۷

$-7, -2, 3, 8, 13, 18, 22$
جمعه ۵

$$a_n = \frac{1}{\sqrt{n} + \sqrt{n+1}} \times \frac{\sqrt{n+1} - \sqrt{n}}{\sqrt{n+1} - \sqrt{n}} \Rightarrow a_n = \sqrt{n+1} - \sqrt{n}$$

حل: -۸

$$a_1 = \sqrt{2} - 1$$

$$a_2 = \sqrt{3} - \sqrt{2}$$

$$a_3 = \sqrt{4} - \sqrt{3} \Rightarrow S_{30} = (\sqrt{2} - 1) + (\sqrt{3} - \sqrt{2} + \dots + \sqrt{35} - \sqrt{34} + \sqrt{36} - \sqrt{35})$$

:

$$a_{29} = \sqrt{35} - \sqrt{34} \Rightarrow S_{30} = -1 + \sqrt{36} = 5$$

$$a_{30} = \sqrt{36} - \sqrt{35}$$

$$S_{r.} = \frac{2 \cdot (2a + 19d)}{2} = \frac{2 \cdot [2a + 19d \times 7]}{2} \Rightarrow S_{r.} = 2 \cdot a + 133 \cdot d$$

حل: -۹

$$20 \cdot S'_{r.} = (a + 20d) + (a + 21d) + \dots + (a + 38d) + (a + 39d)$$

$$\Rightarrow S'_{r.} = 20 \cdot a + (20 + 21 + \dots + 38 + 39) \cdot d$$

$$\Rightarrow S'_{r.} = 20 \cdot a + \frac{20 \times (20 + 39)}{2} \times d \rightarrow S'_{r.} = 20 \cdot a + 590 \cdot d$$

$$d = 7 \Rightarrow S'_{r.} = 20 \cdot a + 4130$$

$$S'_{r.} - S_{r.} = 2800$$

$$\frac{a_n}{a_{n-1}} = \frac{1}{5} \rightarrow q = \frac{1}{5}$$

حل: -۱۰

$$a_1 = 10 \rightarrow aq = 10 \rightarrow a \times \frac{1}{5} = 10 \rightarrow a = 50$$

$$a_n = aq^{n-1} \rightarrow a_n = 50 \times \left(\frac{1}{5}\right)^{n-1}$$

کلاسهای ریاضی مقدماتی

$$\begin{cases} a_1 + a_r = 56 \rightarrow a + a q^r = 56 \\ a_r + a_r = 24 \rightarrow a q + a q^r = 24 \end{cases} \rightarrow \begin{cases} a(1+q^r) = 56 \\ a q(1+q) = 24 \end{cases} \div$$

$$\frac{(1+q^r)}{q(1+q)} = \frac{56}{24}$$

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حل:

$$\Rightarrow \frac{1-q+q^r}{q} = \frac{7}{3} \rightarrow 3q^r - 10q + 3 = 0$$

$$\Rightarrow (3q-1)(q-3) = 0 \rightarrow 3q-1=0 \rightarrow q = \frac{1}{3}$$

یا $\rightarrow q-3=0 \rightarrow q=3$

$$a_r = a + d$$

$$a_5 = a + 4d \Rightarrow (a + 4d)^r = (a + 11d)$$

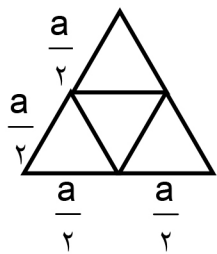
$$a_5 = a + 11d \Rightarrow a^r + 8ad + 16d^r = a^r + 112ad + 11d^r$$

حل:

$$\rightarrow 4ad - 5d^r = 0 \rightarrow d(4a - 5d) = 0 \rightarrow 4a - 5d = 0 \rightarrow a = \frac{5}{4}d$$

$$\Rightarrow \begin{cases} a_r = \frac{5}{4}d + d = \frac{9}{4}d \\ a_5 = \frac{5}{4}d + 4d = \frac{21}{4}d \end{cases} \Rightarrow q = \frac{a_5}{a_r} = \frac{\frac{21}{4}d}{\frac{9}{4}d} = \frac{21}{9} = \frac{7}{3}$$

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$$\begin{cases} A_1 = \frac{\sqrt{3}}{4} a^r \\ A_2 = \frac{\sqrt{3}}{4} \left(\frac{a}{2}\right)^r \\ \vdots \end{cases}$$

$$q = \frac{A_2}{A_1} = \frac{1}{4}$$

$$S_n = \frac{A_1}{1-q} = \frac{\frac{\sqrt{3}}{4} a^r}{1-\frac{1}{4}} = \frac{\sqrt{3}}{3} a^r$$

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حل:

$$S_n = \frac{a}{1-q} \rightarrow \frac{a}{1-q} = 4a^r \rightarrow \frac{a}{1-q} = 4aq$$

$$\Rightarrow 4q(1-q) = 1 \rightarrow 4q^2 - 4q + 1 = 0 \rightarrow (2q-1)^2 = 0$$

$$\rightarrow q = \frac{1}{2}$$

کلاسهای ریاضی مقدماتی

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