

Subject:

Date:

امیرعلی میرزائی

«سفرنامه»

۱۳ - A دم پیلان

$$a_1 = 4 \text{ و } a_4 = 91$$

سوال ۱ -

$$a + 3d - a = 91 - 4 \rightarrow 3d = 87 \rightarrow d = 29 \rightarrow a_n = 4 + 29n - 3$$

$$\rightarrow 2.1 \leq 4 + 29n - 3 \rightarrow 29n \geq 100 \rightarrow \boxed{n \geq 4}$$

 $\begin{matrix} +7 & +7 \\ \downarrow & \downarrow \end{matrix}$

$$10, 17, 24, \dots \rightarrow a_n = 4 + 7(n-1)$$

سوال ۲ -

$$99 < 4 + 7(n-1) < 1000 \begin{cases} 7(n-1) > 95 \rightarrow n > 13.7 \\ 7(n-1) < 996 \rightarrow n < 142.4 \end{cases}$$

$$\rightarrow n \in [14, 142] \rightarrow \text{تعداد } (142 - 14) + 1 = \boxed{129}$$

$$n=1 \rightarrow a_1 + a_2 + a_3 = 9 \rightarrow a_1 + d + a_1 + d + a_1 + d = 9 \rightarrow a_1 = 1 \text{ سوال ۳}$$

$$n=2 \rightarrow a_1 + a_2 + a_3 + a_4 = 0 \rightarrow a_1 + a_1 + d + a_1 + d + a_1 + d + a_1 + d = 0 \rightarrow 4a_1 + 6d = 0 \rightarrow d = -\frac{2}{3}a_1$$

$$\rightarrow t_{14} + t_1 = t_3 + 12d + t_3 + 0d \rightarrow 15 + 12d = 15 + (12 \times -\frac{2}{3}) = \boxed{-1}$$

$$a_r = r^{\pi} - 1, a_{1r} = r^{\pi-1}, a_{1r} = r^{\pi} - r$$

سوال ۲ -

$$a_r = r^{\pi} - 1, a_{1r} = r^{\pi-1}, a_{1r} = r^{\pi} - r$$

$$ra_1 = a_{1r} + a_r \rightarrow a_{1r} + a_r + a_1 = 3a_1$$

$$r(r^{\pi} + r) = r(r^{\pi}) + 4$$

$$\left. \begin{array}{l} a_{1r} - a_{10} = \Delta \\ a_{1r} + a_{10} = 2\Delta \end{array} \right\} \begin{array}{l} ra_{1r} = r \rightarrow a_{1r} = 1\Delta \\ \end{array}$$

سوال ۵ ←

$$a + 14d - (a + 9d) = 5d = \Delta \rightarrow d = 1/5 \Delta$$

$$a_{11} = a_{1r} + 9d = 1\Delta + 14 \cdot \frac{1}{5} \Delta = \boxed{37/5 \Delta}$$

$$\sum_{j=1}^{10} a_j = a + a + d + a + 2d + a + 3d + a + 4d = 10a + 10d \quad \text{سوال ۶ -}$$

$$\sum_{j=1}^{10} a_j = a + 10d + a + 9d + a + 8d + a + 7d + a + 6d + a + 5d = 10a + 50d$$

$$\frac{10a + 10d}{10a + 50d} = \frac{1}{r} \rightarrow 10a + 10d = ar + 50d \rightarrow 10a = 40d \rightarrow a = 4d$$

$$a_1 = 4d, a_r = 1/5 d \rightarrow \frac{a_r}{a_1} = \frac{1/5}{4} = \boxed{1/20}$$

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$$(t_a - t_0) = (t_a - t_0)(t_a + t_0) = (t_{v+d} - t_{v-d})(t_{v+d} + t_{v-d}) \quad \text{سؤال 7}$$

$$\Rightarrow (t_d) \times 2t_v \rightarrow t_v + t_v - d + 10 \rightarrow d = 10 \rightarrow d = 0$$

$$\frac{t_a - t_0}{t_v} = \frac{2t_v \times t_d}{t_v} = \boxed{t_d}$$

$$d = \frac{b-a}{n+1} \rightarrow d = \frac{2 + \sqrt{3} - (2 - 13\sqrt{3})}{13} = \frac{13\sqrt{3}}{13} = \boxed{\sqrt{3}} \quad \text{سؤال 8}$$

$$d = \frac{b-a}{n+1} \rightarrow d = \frac{22-2}{(2n-2)+1} = \dots \rightarrow \quad \text{سؤال 9}$$

$$\frac{20}{2n-2} = \dots \rightarrow \frac{10}{n-1} = \dots$$

$$a_n = 11 \rightarrow 2 + nd = 11 \rightarrow 2 + n\left(\frac{10}{n-1}\right) = 11 \rightarrow \frac{10n}{n-1} = 9 \rightarrow 2n = 9 - n = \boxed{3}$$

$$t_r + t_{14} = t_n + t_{n+12} \rightarrow n + n + 12 = 2 + 14 \rightarrow 2n = 4 \rightarrow n = 2 \quad \text{سؤال 10}$$

$$\frac{t_1}{t_r} = 3 \rightarrow \frac{t_r + d}{t_r} = 3 \rightarrow t_r + d = 3t_r \rightarrow 2t_r = d$$

$$\rightarrow t_r = d \rightarrow t_{14} = d \rightarrow t_{14} = d \rightarrow t_{14} = d + d = 0$$

$$\rightarrow t_r = 0 \quad \boxed{\text{مطلوب}}$$