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سه شنبه
۲۲ بهمن ۱۳۹۹

Tuesday 25
2025/03/25

۱۲۰۲/۱/۵

تکلیف شماره ۱۵

آیا حاشی

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سوال ۱

$$t_1 + t_2 + t_3 = 11 \rightarrow t_1 + t_2 + t_3 = 11 \rightarrow t_1 + (1 + r^2) = 11$$

$$t_1 \times t_2 \times t_3 = 9 \rightarrow t_1 \times t_2 \times t_3 = 9 \rightarrow t_1^3 \times r^3 \rightarrow (t_1 r)^3 = 9$$

$$t_1 r = 3$$

$$\frac{r}{q} = t \rightarrow \frac{r}{q} (1 + q + q^2) = 11$$

$$r (1 + q + q^2) = 11q \rightarrow r + rq + rq^2 = 11q$$

$$rq^2 + rq - 11q + r = 0$$

$$rq^2 - 10q + r = 0$$

$$\Delta = (-10)^2 - 4r^2 = 100 - 4r^2 = 100 - 4r^2$$

$$q = \frac{10 \pm \sqrt{100 - 4r^2}}{2} \rightarrow \frac{10 + 10}{2} = 10 = \frac{10}{1} = 10$$

$$\frac{10 - 10}{2} = 0 = \frac{10}{2} = 5$$

$q = \frac{1}{10}$

$$t_1 r \times t_2 r^2 \times t_3 = 10 \times 10 \times 1 = 100$$

$$10 + 10 + 1 = 21$$

$$b^2 = a \cdot c \rightarrow (21^2 + 5)(21^2 - 5) = 42^2$$

$$21^2 - 21^2 + 5 \cdot 21^2 - 1 = 21^2 \rightarrow 21^2 = 21^2 + 10 \cdot 21^2 - 1$$

$$0 = 21^2 - 1 \rightarrow 21^2 = 1 \rightarrow 21 = 1$$

$$21^2 = 1 / 21^2 + 1 = 1 / 21^2 - 1 = 1$$

$$q = \frac{a_1}{a_r} = \frac{r}{1} = \frac{1}{r}$$

$$S_n = a \left[\frac{q^n - 1}{q - 1} \right] \Rightarrow 1 \times \left[\frac{1 - \left(\frac{1}{r}\right)^n}{1 - \frac{1}{r}} \right]$$

$$\Rightarrow \Delta 1 \times \frac{1}{1} \Rightarrow S_n = \frac{1}{1}$$

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$$1 + t_1 + t_1 r + t_1 r^2 + t_1 r^3 = \frac{121}{1}$$

$$\frac{q\omega - 1}{q - 1} = \frac{121}{1} \rightarrow r = \frac{1}{\mu} \rightarrow 1 + \frac{1}{\mu} + \frac{1}{\mu^2} + \frac{1}{\mu^3} = \frac{121}{1}$$

$$\frac{11 + 11 + 11 + 11 + 11}{11} = \frac{121}{11} \neq \frac{121}{11}$$

$$r = \frac{1}{\mu} \rightarrow \frac{11 + 11 + 11 + 11 + 11}{11} = \frac{121}{11}$$

$$S_\omega = a_1 \left[\frac{1 - q^\omega}{1 - q} \right] = 121 \times \left[\frac{1 - \frac{1}{121}}{1 - \frac{1}{121}} \right] = 121 \times \frac{120}{120} = 120$$

سوال ۴

$$a_1 = 1 \quad a_1 = 4K$$

$$a_1 + 4d = 45 \rightarrow 4d = 44 \Rightarrow d = 11, \omega$$

$$a_k = a_1 + 3d \Rightarrow 1 + 3(11) = 34, \omega$$

$$t_1 = 1 \quad t_1 = 45$$

$$t_1 \times r^4 = 45 \rightarrow r^4 = 45 \rightarrow r = 3 \quad t_r = t_1 r^3 = 1 \times 3^3 = 27$$

$$A + B = 34, \omega + 27 = 61, \omega$$

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$$t_1 + (n-1)d = -۲۴ + (n-1) \frac{1}{۴}$$

سوال ۵

$$t_{101} = t_1 + 100d = -۲۴ + 100 \times \frac{1}{۴} = 1$$

$$\begin{matrix} ۲۳, ۷۵ \\ \nearrow \\ -۲۴, -\frac{9d}{۴} \\ \searrow \\ +\frac{1}{۴} \end{matrix}$$

$$۱۲۸, \frac{۷۴}{۲}, \frac{۳۲}{۲}, \frac{۱۴}{۲}, \frac{۱}{۲}, \frac{۴}{۲}, \frac{۲}{۲}, ۱$$

$$q^{m-n} = \frac{a_m}{a_n} \rightarrow q^{\frac{1}{2}} = \frac{1}{128} \rightarrow q = \frac{1}{۲} \quad \checkmark$$

$$t_v = t_1 + ۲d$$

$$t_v = t_1 + 4d$$

$$t_q = t_1 + 1d$$

$$\Rightarrow (t_1 + 4d)^2 = (t_1 + ۲d)(t_1 + 1d)$$

سوال ۶

$$t_1^2 + ۳۲d^2 + ۱۲dt = t_1^2 + 1dt + ۲dt + ۱۴d^2$$

$$\Rightarrow d = 1$$

$$۲ad + ۲o.d^2 = 0 \rightarrow ۲d(a + 1.d) = 0$$

$$d = 0 \rightarrow T_۲ = T_v = T_q = a$$

$$\rightarrow a + 1.d = 0 \Rightarrow a = -1.d$$

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$$d = \frac{-a}{10} \quad \checkmark$$

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سوال ۷

$$t_v = t_1 + d$$

$$t_v = t_1 + ۳d$$

$$t_1 = t_1 + ۷d$$

$$\Rightarrow (t_1 + ۳d)^2 = (t_1 + d)(t_1 + ۷d)$$

$$t_1^2 + 9d^2 + 4dt = t_1^2 + 7dt + dt + ۷d^2$$

$$9d^2 - ۷d^2 = 11td - 4td$$

$$۲d(d - t) = 0 \rightarrow d = t$$

$$t_1, t_2, t_3 = ۲d, ۳d, ۷d$$

$$d = ۲$$

$$\rightarrow ۲d = \frac{1}{۴} \rightarrow d = \frac{1}{8} \rightarrow t_1, t_2, t_3 = \frac{1}{4}, \frac{3}{4}, \frac{7}{4} = ۱۲۸ \quad \checkmark$$

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سوال ۸ ۱۴۰۴/۱/۹

① $a, ar, ar^2, ar^3, \dots \rightarrow {}^{\text{I}}(ar) = r(ar^2), ar^3$

① $Far^2 = {}^{\text{I}}ar + ar^3 \rightarrow {}^{\text{I}}r^2 = {}^{\text{I}}r + r^3 \rightarrow {}^{\text{I}}r^2 - {}^{\text{I}}r - r^3 = 0$

① چون دنباله منتهی است
مقادیر مشخص

$r(r^2 - r + 1) = 0$
 $r(r-1)(r+1) = 0 \rightarrow r = 0$

① $r = 0 \rightarrow$ دنباله ثابت می شود
چون حد اول آن صفر است

$\begin{cases} r = 1 \\ r = -1 \end{cases}$

① $r = 1 \rightarrow$ دنباله ثابت است

① $r = -1$

سوال ۹

① $1, \frac{1}{2}, \dots \rightarrow d = \frac{1}{2} - 1 = \frac{1-2}{2} = -\frac{1}{2}$

① $a_n = 1 + (n-1)d \rightarrow 1 + \frac{(n-1)}{2} \rightarrow a_2 = 1 - \frac{1}{2} = \frac{1}{2} + n$

① $\begin{cases} a_1 = 1 - \frac{1}{2} = \frac{1}{2} + n \\ a_{11} = 1 - \frac{11}{2} = 1 - 5 = -4 + n \end{cases}$

① $a_{11} = 1 - \frac{11}{2} = 1 - 5 = -4 + n$

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

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

① $\frac{n}{2} = -\frac{1}{2} - \frac{1}{4} \rightarrow \frac{n}{2} = \frac{-2-1}{4} = \frac{-3}{4} \rightarrow n = \frac{-3}{2}$

$-1 + \frac{n}{2} = \frac{-3}{2} \rightarrow \frac{n}{2} = \frac{-3}{2} + 1 = \frac{-3+2}{2} = \frac{-1}{2} \rightarrow n = -1$

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سوال ۱۰ MARCH فروردین

$$a + ar^3 + ar^4 = v^3 \rightarrow a(1 + r^3 + r^4) = v^3 \quad ①$$

حساب $a, ar^3, ar^4, \dots$

$$\left. \begin{aligned} A_2 = A_1 + d &\Rightarrow ar^3 = a + d \\ A_{10} = A_1 + 9d &\Rightarrow ar^9 = a + 9d \end{aligned} \right\} \begin{aligned} ar^4 &= a + 9(ar^3 - a) \\ ar^4 &= a + 9ar^3 - 9a \end{aligned}$$

$$r^4 = 9r^3 - 8$$

$$r^4 = 9r^3 - 8$$

$$r^4 - 9r^3 + 8 = 0 \rightarrow (r^3 - 1)(r - 8) = 0 \rightarrow \left. \begin{aligned} r^3 &= 1 \rightarrow r = 1 \\ r &= 8 \end{aligned} \right\}$$

$$a(1 + 1 + 9) = v^3$$

$$axv^3 = v^3 \rightarrow a = 1$$

$$\rightarrow A_1 = 1$$

$$\rightarrow A_2 = 1$$

$$\rightarrow A_{10} = 10$$

$$\left. \begin{aligned} A_1 &= 1 \\ A_2 &= 1 \end{aligned} \right\} 1 - 1 = v = d$$

