

پاسخنامه تشریحی تکلیف شماره ۵۰۰... کلاس دهم... ..

$$q + a_r + a_r = \frac{a_r}{q} + a_r + a_r q = 11 \rightarrow a_r \left(\frac{q^2 + q + 1}{q} \right) = 11 \rightarrow \frac{q^2 + q + 1}{q} = \frac{11}{r} \rightarrow 4q^2 + 4q + 4 = 11q$$

$$a_1 a_r a_r = \frac{a_r}{q} \times a_r \times a_r q = a_r^3 = 94 \rightarrow a_r = 4$$

$$\rightarrow 4q^2 - 11q + 4 = 0$$

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

$$\rightarrow q^2 - 11q + 4 = 0 \rightarrow (q-1)(q-14) = 0$$

$$\rightarrow \begin{cases} q = 14 \rightarrow 4 \notin \mathbb{N} \\ q = 1 \rightarrow q = \frac{1}{4} \rightarrow \frac{1}{4} \notin \mathbb{N} \end{cases}$$

$$(a_1^2 + 4)(a_1^2 - 2) = 4a_1^2 \rightarrow a_1^4 + 2a_1^2 - 1 = 4a_1^2 \rightarrow a_1^4 - 2a_1^2 - 1 = 0 \rightarrow (a_1^2 - 2a_1 + 1) - 9 = 0$$

$$(a_1^2 - 1)^2 - 3^2 = 0$$

$$(a_1^2 - 4)(a_1^2 + 2) = 0$$

$$\rightarrow a_1^2 = 4 \rightarrow a_1 = \pm 2$$

$$\rightarrow \begin{cases} a_1 = 2 \rightarrow 1, 4, 2, \dots \leftarrow a_1 = 2q \\ a_1 = -2 \rightarrow 1, -4, 2, \dots \leftarrow a_1 = -2q \end{cases}$$

$$\rightarrow S_n = a_1 \left(\frac{1 - q^n}{1 - q} \right) \Rightarrow S_5 = 1 \left(\frac{1 - \left(\frac{1}{4}\right)^5}{1 - \frac{1}{4}} \right) = \frac{171}{1}$$

$$1 + q + q^2 + q^3 + q^4 = \frac{171}{11} \xrightarrow{\text{مخرج اول}} a + aq + aq^2 + aq^3 + aq^4 = S_5 = \frac{171}{11} \times \frac{11}{44} = \frac{171}{44}$$

$$a(1 + q + q^2 + q^3 + q^4)$$

$$1, a_r, a_r, \boxed{a_r}, a_1, a_r, 94 \rightarrow A = \frac{94+1}{4} = 23, 5$$

$$\Rightarrow A+B \begin{cases} 23, 5 + 1 = 24, 5 \\ 23, 5 - 1 = 22, 5 \end{cases}$$

$$1, b_r, b_r, \boxed{b_r}, b_1, b_r, 94 \rightarrow B^2 = 94 \times 1 \rightarrow B = \pm \sqrt{94} = \pm 1$$

اجل $\frac{b_r}{b_1} = q^3$ عبارت مرتبه اول نیست

$$a'_n = \frac{-94}{4}, \frac{-94}{4}, \dots \rightarrow a'_n = a'_1 + (n-1)d \rightarrow a'_n = -23 + \frac{1}{4}(n-1) \rightarrow a'_{101} = -23 + (100) \frac{1}{4} = 1$$

$$+ \frac{1}{4} = d$$

$$a_n = 171, a_r, \dots \Rightarrow a_r = 171q \rightarrow a_n = a_1 q^{n-1} \rightarrow a_1 = 171 \times q^4 = 1 \rightarrow q^4 = \frac{1}{171} = \left(\frac{1}{4}\right)^4$$

$$\Rightarrow q = \frac{1}{4}$$

$\begin{aligned} a_w &= a + rd \\ a_v &= a + qd \\ a_q &= a + 1d \end{aligned} \rightarrow \begin{cases} a_w q^3 + a_w + 4d = a_v \times 11 \rightarrow 3a_w q^3 = 3a_w + 11d \\ a_w q^3 + a_q = a_w + 4d \times 2 \rightarrow 2a_w q^3 = 2a_w + 11d \end{cases}$ $3a_w(q^3 - 1) = 11d - 11d \rightarrow 3a_w(q^3 - 1) = 0$ $\rightarrow (q-1)(q^2+q+1) = 0 \rightarrow \begin{cases} q=1 \\ q^2+q+1=0 \end{cases}$ $q=1 \rightarrow \alpha \text{ حالت}$ $q^2+q+1=0 \rightarrow q = \frac{-1 \pm \sqrt{1-4}}{2} = \frac{-1 \pm \sqrt{-3}}{2}$ $\beta \rightarrow q=1 \rightarrow a_w = a_v = a_q = a + d + a_w = a_w \rightarrow d=0$ $\alpha \rightarrow \frac{1}{q} a_w = a_v \rightarrow \frac{a}{q} + d = a + qd \rightarrow \frac{a}{q} - 5d = 0 \rightarrow d = \frac{a}{5}$	6
$\begin{aligned} a_v &= a + d \\ a_f &= a + rd \\ a_n &= a + vd \end{aligned} \rightarrow \begin{cases} a_v q^2 = a_f = a + rd \rightarrow 3a_v q^2 = 3a + 3rd \\ a_v q^2 + a_n = a + 4d \end{cases}$ $3a_v q^2 - a_v q^2 = 3a + 3rd - a - 4d \rightarrow 2a_v q^2 = 2a + 3rd - 4d$ $2a_v(q^2 - 1) = 2a + 3rd - 4d$ $\rightarrow (q-1)(q+1) = 0 \rightarrow \begin{cases} q=1 \\ q=-1 \end{cases}$ $q=1 \rightarrow \alpha \text{ حالت}$ $q=-1 \rightarrow \beta \text{ حالت}$ $\beta \rightarrow b_n = b_1 \times q^{n-1} \rightarrow b_{10} = \frac{1}{q} \times r^9 = r^9 = 121$	7
$3a_v, 2a_w, a_f \rightarrow 3a_v, 2a_v q^2, a_v q^2 \rightarrow 3a_v + a_v q^2 = 2a_v q^2 \rightarrow q^2(3+q^2) = 4a_v q^2$ $\rightarrow q^2 - 4q + 3 = 0 \rightarrow (q-1)(q-3) = 0 \rightarrow \begin{cases} q=1 \\ q=3 \end{cases}$ $q=1 \rightarrow \alpha \text{ حالت}$ $q=3 \rightarrow \beta \text{ حالت}$	8
$a_n = \frac{1}{k}, \frac{v}{k}, \dots \rightarrow a_n = a + (n-1)d \rightarrow a_n = r + \frac{1}{k}(n-1)$ $\rightarrow \frac{a}{k} + k, \frac{1}{k} + k, k-1$ $\rightarrow \frac{a}{k} + k, \frac{1}{k} + k, k-1 \rightarrow \frac{a}{k} + \frac{-21}{k}, \frac{1}{k} + \frac{-21}{k}, \frac{-4}{k} + \frac{-21}{k} \rightarrow \frac{-14}{k}, \frac{-20}{k}, \frac{-25}{k} \rightarrow q = \frac{-25}{-14} = \frac{25}{14}$	9
$a, aq^3, aq^4 \rightarrow aq^3 - a = d, a(q^3 - 1)$ $a, a+d, a+qd \rightarrow aq^3 = a + a(q^3 - 1)$ $aq^4 = a + qd(q^3 - 1)$ $\rightarrow q^4 - 9q^3 + 1 = 0 \rightarrow (q^3 - 1)(q - 1) = 0 \rightarrow \begin{cases} q=1 (\alpha) \\ q^3 - 1 = 0 \end{cases}$ $\alpha \rightarrow a = aq^3 \rightarrow aq^3 - a = d = 0$ $\beta \rightarrow a + aq^3 + aq^4 = a(1 + q^3 + q^4) = 13 \rightarrow a = 1 \rightarrow 1 + 1 + 1 = 3 \rightarrow d = 1$	10