نام و نام خانوادگی ...ارشیا شیربابایی... پاسخنامه تشریحی تکلیف شماره ...۱۵... کلاس ...دهم ریاضی A...

۱	$a_1 + ar + ar^2 = 21 \longrightarrow a_1(1+r+r^2) = 21 \longrightarrow \frac{4}{r} + 4 + 4r = 21 \xrightarrow{\times r} 4 + 4r + 4r^2 = 21r$ $a_1 \times a_1 r \times a_1 r^2 = a^3 r^3 = 64 \longrightarrow ar = \sqrt[3]{64} = 4 \longrightarrow a = \frac{4}{r}$ $\longrightarrow 4r^2 - 17r + 4 = 0 \longrightarrow r = \frac{17 \pm \sqrt{17^2 - 64}}{8} = \frac{17 \pm 15}{8} = \begin{cases} 4 & \times \\ \frac{1}{4} & \checkmark \end{cases}$ ۲ غیرجواب است پس ۴ نیست و $\frac{1}{4}$ است
۲	$b^2 = ac \longrightarrow (2x)^2 = (x^2-2)(x^2+4) \longrightarrow 4x^2 = x^4 + 2x^2 - 8 \longrightarrow x^3 - 2x^2 - 8 = 0$ $\xrightarrow{x^2 = z} z^2 - 2z - 8 = 0 \Rightarrow z = x^2 = 2 \pm 2\sqrt{3} \longrightarrow x = \sqrt{2+2\sqrt{2}} \,,\; x^2 - 2 = 2\sqrt{3} \,,\; 2x = 2\sqrt{2+2\sqrt{3}}$ $;\; x^2 + 4 = 6 + 2\sqrt{3}$ $\qquad q = \frac{a_2}{a_1} = \frac{2x}{x^2-2} = \frac{2\sqrt{2+2\sqrt{3}}}{2\sqrt{3}} \longrightarrow ?$
۳	$1 + q + q^2 + q^3 + q^4 = \frac{121}{81}$ $\qquad \underbrace{a(1+q+q^2+q^3+q^4)}_{a_1 + a_2 + \dots + a_5} = \frac{121}{81} a = \frac{121}{\cancel{81}_{1}} \times \cancel{243}^{3} = 363$
۴	$1, -, -, \overset{a}{-}, -, -, 64$ $\qquad \overset{\text{حسابی}}{2a} = 64 + 1 = 65 \qquad a = \frac{65}{2} = 32{,}5$ $1, -, -, \overset{b}{-}, -, -, 64$ $\qquad \overset{\text{هندسی}}{b^2} = 1 \times 64 = 64 \qquad b = \sqrt{64} = 8$ $a + b = 32{,}5 + 8 = 40{,}5$
۵	$\cancel{-24}, \frac{-95}{4}, \dots$ $\qquad a_{101} = a_1 + 100d = -24 + \left(\frac{\cancel{100}^{25} \times 1}{\cancel{4}}\right) = 1$ $\frac{-96}{4}$ $+\frac{1}{4} \longrightarrow d$ $128, a_2, -$ $\qquad a_8 = 1 \qquad ar^7 = 2^7 \times r^7 = 1 \longrightarrow r = \frac{1}{2}$

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۶

$a_3, a_7, a_9 \to (a+2d), (a+6d), (a+8d) \to b^2 = ac \to (a+6d)^2 = (a+2d)(a+8d)$

$\to \cancel{a^2} + 12ad + 36d^2 = \cancel{a^2} + 10ad + 16d^2 \to 2ad + 20d^2 = 0 \to 2d(a+10d) = 0$

$a + 10d = 0$

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

یا $2d = 0$ ← چونکه مقدار ثابت نیست ✗

یا $0 = a + 10d$ ← ✓

۷

$a+d, a+2d, a+7d \to (a+2d)^2 = (a+d)(a+7d) = \cancel{a^2} + 4ad + 4d^2 = \cancel{a^2} + 8ad + 7d^2$

$\to -2ad + 2d^2 = 0 \to 2d(-a+d) = 0 \quad d - a = 0 \to d = a \to \frac{1}{4} \cdot \frac{1}{4}$

$\underbrace{\frac{1}{2}, 1}_{\times 2}, \underbrace{\,2}_{\times 2} \quad r = 2 \qquad a_{10} = a_1 \times r^9 = \frac{1}{2} \times 2^9 = \underline{256}$

چونکه مقدار ثابت نیست $2d = 0$ ✗ ولی $d - a = 0$ ✓

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$3ar, 2ar^2, ar^3 \to 2b = a + c \to 2(\cancel{2ar^2}) = \cancel{3ar + ar^3} \to 4r = 3 + r^2 \to r^2 - 4r + 3 = 0$

$4ar^2 \quad ar(3+r^2)$

$r = \frac{4 \pm \sqrt{16-12}}{2} = \begin{cases} 3 & ✓ \\ 1 & ✗ \end{cases} \to$ ثابت نیست

۹

$a_1 = 2 \quad a_2 = \frac{7}{4} \qquad a_2 - a_1 = \frac{7}{4} - 2 = -\frac{1}{4} \qquad a_4 = 2 + (3 \times -\frac{1}{4}) = \frac{5}{4} \quad a_8 = \frac{1}{4}$

$a_{13} = -1 \qquad (a_4 + K), (a_8 + K), (a_{13} + K) \to (\frac{5}{4} + K) \times (\frac{1}{4} + K) \times (K - 1) \to$

$\to \frac{K}{2} + K^2 = -5/4 - K + \frac{5K}{4} + K^2 + \frac{1}{16} \to \frac{K}{2} - \frac{K}{4} = -\frac{5}{4} - \frac{1}{16} \to \frac{K}{4} = -\frac{21}{16}$

$\to K = -\frac{21}{4} \qquad \to q = (1/4 - 21/4) \div (-1 - 21/4) = (-5) \div (\frac{25}{4}) = \underline{4/5}$

۱۰

$a + aq^2 + aq^4 = 73 \qquad a + d = aq^2 \quad a + 9d = aq^4$

$\to d = aq^2 - a \to a(q^2 - 1) \quad / \to 9d = aq^4 - a \to a(q^4 - 1)$

$9d = a(q^4 - 1) \to 9 \times \cancel{a}(q^2 - 1) = \cancel{a}(q^4 - 1) \to 9q^2 - 9 = q^4 - 1 \to q^4 - 9q^2 + 8 = 0$ ثابت نیست!

$\xrightarrow{t = q^2} t^2 - 9t + 8 = 0 \to (t-1)(t-8) = 0 \quad t = \begin{cases} 1 \\ 8 \end{cases} \to q^2 = 1$ یا $q^2 = 8 \quad q = \begin{cases} 1 & ✗ \\ 2 & ✓ \end{cases}$

$a + aq^2 + aq^4 = 73 \to a(1 + q^2 + q^4) = 73 \to a(1 + 8 + 64) = 73 \to a \cdot 73 = 73 \to a = 1$

$d = a(q^2 - 1) = 1(8 - 1) = \underline{7}$