مهدی [illegible] شاری — دهم A — تکلیف: ۱۵

۱)

$a_1 = a \quad a_2 = aq \quad a_3 = aq^2$

$\rightarrow a \times aq \times aq^2 = a^3q^3 = 64$

$\rightarrow aq = 4$

$a + aq + aq^2 = \frac{4}{q} + 4 + 4q = 21$

$\rightarrow q = \begin{cases} 4 \\ \frac{1}{4} \end{cases}$

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۲)

$x^2+4 \; , \; 2x \; , \; x^2-2$

$(2x)^2 = (x^2+4)(x^2-2) \qquad 4x^2 = x^4 - 2x^2 + 4x^2 - 8$

$x^4 - 2x^2 + 4x^2 - 8 - 4x^2 = 0 \rightarrow x^4 - 2x^2 - 8 = 0 \rightarrow x^4 - 2x^2 = 8$

$\rightarrow x = 2$

$a = x^2 + 4 \rightarrow a = 2^2 + 4 = 8 \qquad S_n = a\frac{1-q^n}{1-q} \qquad S_7 = 8 \times \frac{1-\frac{1}{2^7}}{1-\frac{1}{2}}$

$2x = 2 \times 2 = 4 \qquad q = \frac{1}{2}$

$S_7 = 8 \times \frac{1-\frac{1}{128}}{1-\frac{1}{2}} = 8 \times \frac{\frac{127}{128}}{\frac{1}{2}} = \frac{1016}{64}$

سوال ۳:

$1 + q + q^2 + q^3 + q^4 = \frac{121}{81}$

$a = 243 \qquad S_5 = 243 \times 1 + 243q + 243q^2 + 243q^3 + 243q^4$

$243(1 + q + q^2 + q^3 + q^4) = \frac{121}{81} \times 243 = 363$

سوال ۴:

$1, \bigcirc, \bigcirc, \bigcirc, \bigcirc, \bigcirc, 64$

$\frac{64-1}{6} = \frac{63}{6} = 10.5 = d \qquad 1 + 3d = 1 + 10.5 \times 3 = 1 + 31.5 = 32.5 = A$

$8 + 32.5 = 40.5$

$q^6 = 64 \rightarrow q = 2 \qquad a_4 = aq^3 = 1 \times 2^3 = 8$

سوال ۵:

$-24, -\frac{95}{4}, \ldots \qquad 128, a_2, \ldots$

$+\frac{1}{4}$

$a_n = \frac{1}{4}n - 24\frac{1}{4} \qquad a_{101} = -24 + (100)\frac{1}{4} = -24 + 25 = 1$

$1 = aq^7 \qquad 1 = 128q^7 \rightarrow \frac{1}{128} = q^7 \rightarrow q = \frac{1}{2}$

سوال ۹:

$a_2, a_5, a_9 = t_1, t_2, t_3$ (+3d, +4d)

$a_2 = a+d$ $a_5 = a+4d$ $a_9 = a+8d$

$b^2 = a.c \rightarrow (a+4d)^2 = (a+d)(a+8d) = a^2+12ad+32d^2 = a^2+10ad+16d^2$

$12ad - 10ad = 32d^2 - 16d^2 \rightarrow 2ad = 16d^2 \rightarrow 2a = 16d \rightarrow a = 8d \rightarrow d = \frac{a}{8}$

$q = \frac{a_5}{a_2} = \frac{a+4d}{a+d} = \frac{a+4(\frac{a}{8})}{a+(\frac{a}{8})} = \frac{1+\frac{4}{8}}{1+\frac{1}{8}} = \frac{\frac{12}{8}}{\frac{9}{8}} = \frac{12}{9} = \frac{4}{3}$

سوال ۷:

$a_2, a_4, a_8 = t_1, t_2, t_3$

$a_2 = a+d$ $a_4 = a+3d$ $a_8 = a+7d = a, aq, aq^2$

$a_4 - a_2 = 2d = aq - a = a(q-1)$

$a_8 - a_4 = 4d = aq^2 - aq = aq(q-1)$

$\frac{4d}{2d} = \frac{aq(q-1)}{a(q-1)} \rightarrow q = 2, a = \frac{1}{4}$

$a_{10} = \frac{1}{4} \times 2^9 = 2^7 = 128$

سوال ۸:

$2a_2 \rightarrow 2(aq)$

$2a_3 \rightarrow 2(aq^2)$

$a_4 \rightarrow aq^3$

$\} t_1, t_2, t_3$

قدر نسبت $= 2 = q$

$2t_2 = t_1 + t_3 \rightarrow 2 \times 2(aq^2) = 2(aq) + aq^3 = 4aq^2 = 2aq + aq^3$ با فاکتور a

$a(4q^2) = a(2q + q^3) \rightarrow q(4q) = q(2+q^2)$ $2q = 2 + q^2$

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

$q = 1 \rightarrow$ نامناسب

$q = 2$

سوال ۹:

$2, \frac{2}{4}, \ldots$

$\frac{8}{4}, \frac{2}{4}, \ldots$

$t_4 = -\frac{1}{4} \times 4 + 2\frac{1}{4} = 1\frac{1}{4}$

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

t_4, t_8, t_{12}

$t_8 = -\frac{1}{4} \times 8 + 2\frac{1}{4} = \frac{1}{4}$

$t_{12} = -\frac{1}{4} \times 12 + 2\frac{1}{4} = -\frac{1}{4}$

$t_{4+x}, t_{8+x}, t_{12+x}$

$1\frac{1}{4}, \frac{1}{4}, -1$

$1\frac{1}{4}+x, \frac{1}{4}+x, -1+x, \ldots$ $b^2 = ac$

$\frac{5}{4}, \frac{1}{4}, -\frac{1}{4} \rightarrow (\frac{1}{4}+x)^2 = (-1+x)(\frac{5}{4}+x) = x^2 + 2\frac{1}{4}x = -\frac{5}{4} - \frac{1}{16}$

سوال ۹ ادامه

$r = \frac{-1/25}{0/25} = -\frac{21}{4}$

$a_1 = -1 + r = -\frac{25}{4}$ $\quad a_2 = \frac{1}{4} + r = \frac{1}{4} - \frac{21}{4} = -5$ $\quad a_3 = \frac{5}{4} + r = \frac{5}{4} - \frac{21}{4} = -4$

$q = \frac{a_3}{a_1} = \frac{-5}{-\frac{25}{4}} = \frac{4}{5}$ $\quad q = \frac{4}{5}$

سوال ۱۰ :

a_1, a_4, a_7 $\quad a_4 = aq^3$, $a_7 = aq^6$ $\quad a_1 = A$ $\quad a_{10}$

$a_1 + a_4 + a_7 = 42$

$aq^3 = A + d$ $\quad aq^6 = A + 9d$ $\quad a + 9 \times a(q^3 - 1) = aq^9$

$1 + 9(q^3 - 1) = q^9$ $\quad y = q^3$

$1 + 9(y - 1) = y^3 \rightarrow 9y - 8 = y^3$

$(y-1)(y-8) = 0 \longrightarrow y = 1$ یا $y = 8$ $\quad q = 1 \rightarrow q^3 = 1 \rightarrow y = 1$ اگر

$q = 2 \rightarrow q^3 = 8 \rightarrow y = 8$ اگر

حالت اول $\rightarrow q = 1 \rightarrow$ تناقض

حالت دوم $\rightarrow q = 2 \rightarrow d = a(q^3 - 1) = 1 \times (8 - 1) = 7$

$d = 7 \mid q = 0$

$d = 0 \mid q = 1$