

نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره ۱۰۰ کلاس: *مجموعه*

الف) $a_{10} = aq^9 = \frac{1}{4} \times 2^9 = 256 \rightarrow 256$ $a_1 = \frac{1}{4}, 1, 2, \dots$

ب) $\frac{a_{17}}{a_{13}} = \frac{aq^{17}}{aq^{13}} = q^4 = 2^4 = 16$

ج) $q^{n+1} \cdot \frac{b}{a} = \frac{aq^9}{aq^3} = q^6 \rightarrow n+1=7 \rightarrow n=6$

د) $\frac{1}{4} q^{n-1} = 128 \quad q^{n-1} = 256 = 2^8 \rightarrow n-1=9 \rightarrow n=10$

$a_5 = 12 = aq^4, a_1 = 94 = aq^0 \rightarrow q^4 = \frac{94}{12} = 1 \rightarrow q = 1$

$a \times 2^2 = 12 \rightarrow a = 0.75 = \frac{3}{4}$

$a_{10} = \frac{3}{4} \times 2^9 = 1512 = 1512$

$(a_1)^n = (a_3)^0 = 2 \times 10^3 \quad a_1 \times a_2 \times a_3 \times \dots \times a_8 \times a_9 = 2 \times 10^3$

الف) $a_3 = 3$

ب) $a_1 \times a_9 = a_3 \times a_7 = 1 \times 3 = 3$

$2\sqrt{2} \rightarrow 2^a, \sqrt{2}, 2^b$

$(2\sqrt{2})^2 = 2^a \times 2^b$

$14 \times 2 = 2^{a+b} = 2^2 = 2^0 \rightarrow a+b=0$

$\frac{b}{a+b} = \frac{b+a}{n+1} = \frac{0}{1+1} = \frac{0}{2} = 0, 0$

$aq^2, aq^4, aq^{10} \rightarrow x+1, x, 1-x$

$a_3 \times a_{11} = a_7 \times a_7 \rightarrow (a_7)^2 = a_3 \times a_{11}$

$x^2 = (1-x)(x+1) = 1-x^2$

$2x^2 = 1 \quad x^2 = \frac{1}{2} \quad x = \frac{1}{\sqrt{2}} \approx \frac{\sqrt{2}}{2} = \frac{\sqrt{2}}{2}$

$a_1 + a_2 = 11 \quad a + aq^2 = a(1+q^2) = a(1+q)(1-q+q^2)$ $a_2 + a_3 = 12 \quad aq + aq^3 = aq(1+q) = 12$ $\frac{11}{12} = \frac{(1-q+q^2)}{q} = \frac{1}{q} \quad \vee q = 3(1-q+q^2) \rightarrow \vee q = 3 - 3q + 3q^2 \rightarrow 3q^2 - 4q + 3 = 0$ $a(1+q^2) = 11 \rightarrow a = 1 \quad a(1+(\frac{1}{3})^2) = 11$ $1, 3, 9, 27, \dots \quad a \times \frac{11}{12} = 11$ $L \rightarrow a = 12 \rightarrow (12, 36, 108, \dots)$ $q = \frac{10 \pm \sqrt{100 - 36}}{4} = \frac{10 \pm 8}{4} = \frac{18}{4} = \frac{9}{2} \text{ or } \frac{1}{2}$	سری جواب 6
$a_1 + a_2 + a_3 = 12 \quad \frac{a}{q} + a + aq = 12 \rightarrow \frac{12}{q} + 12 + 12q$ $a_1 \times a_2 \times a_3 = 12 \quad \frac{a}{q} \times a \times aq = a^3 = 12 \rightarrow a = \sqrt[3]{12}$ $(\frac{12}{q} + 12 + 12q = 12) \times q \rightarrow 12 + 12q + 12q^2 = 12q = 12q^2 - 12q + 12 = 0$ $1, \sqrt[3]{12}, q \in (q, \sqrt[3]{12}) \quad q = \frac{10 \pm \sqrt{100 - 36}}{4} = \frac{10 \pm 8}{4} = \frac{18}{4} = \frac{9}{2} \text{ or } \frac{1}{2}$	7
$S_{10} = a \times (\frac{q^{10} - 1}{q - 1}) = 12 \times \frac{3^{10} - 1}{3 - 1}$ $3^{10} - 1 = (3^5 + 1)(3^5 - 1) = (243 + 1)(243 - 1) = 244 \times 242 = 59068$ $S_{10} = \frac{12 \times 59068}{2} = 354408$ $S_n = (a_1 \times a_{10})^{\frac{n}{2}} = (1 \times 10^9)^{\frac{n}{2}} = (10^9)^{\frac{n}{2}}$	8
$a, aq, aq^2, \dots$ $aq^2 - aq = aq - (1 - a)$ $a - aq = a(1 - q) \Rightarrow \dots$ $\frac{aq(1 - q)}{a(1 - q)} = q$ سری جواب	9
$S_n = a(\frac{q^n - 1}{q - 1}) \rightarrow S_n = a, aq, aq^2, \dots$ $qS_n = aq + aq^2 + \dots + aq^n$ $S_n - qS_n = (a + aq + \dots + aq^{n-1}) - (aq + \dots + aq^n)$ $S_n(1 - q) = a - aq^n$ $\rightarrow S_n = \frac{n}{q} (1 + (n-1)d)$	$S_n = a + a + d + a + 2d + \dots + a_n$ $a_n = a_1 + (n-1)d$ $S_n = a_1 + a_2 + a_3 + \dots + a_{n-1} + a_n$ $S_n = a_n + a_{n-1} + \dots + a_2 + a_1$ $2S_n = (a_1 + a_n) + (a_2 + a_{n-1}) + \dots + (a_n + a_1)$ $2S_n = n(a_1 + a_n)$ $\rightarrow S_n = \frac{n(a_1 + a_n)}{2}$ 10