

19111111

نام و نام خانوادگی کلاس پاسخنامه تشریحی تکلیف شماره کلاس

(الف) $t_{10} = aq^9 \Rightarrow q = 2 \quad a = \frac{1}{2} \quad t_{10} = aq^9 = \frac{1}{2} \times 2^9 = 2^8 = 256$

(ب) $\frac{aq^{14}}{aq^{12}} = q^2 = 16$
 $aq^9 = \frac{1}{2} \times 2^9 = 2^8 = 256$ (ج)

$b^2 = a \times c \rightarrow b = \sqrt{a \times c} = \sqrt{2 \times 256} = 32 \rightarrow 32 = aq^{x-1} = \frac{1}{2} q^{x-1} \rightarrow q^{x-1} = 64 \Rightarrow x-1 = 6 \rightarrow x = 7 \rightarrow a_7 = 32$ (د)

$aq^{x-1} = 128 = \frac{1}{2} q^{x-1} \quad q^{x-1} = 256 \Rightarrow x-1 = 8 \quad x = 9$ (ه)

$a_5 = 12 = aq^4$
 $a_1 = 94 = aq^0$
 $\frac{aq^4}{aq^0} = \frac{12}{94} = q^4 = 1 \Rightarrow q = 1$
 $a = \frac{12}{q^4} = \frac{12}{1} = 12$
 $a_{10} = aq^9 = \frac{12}{1} \times 1^9 = 12$ (و)

(الف) $a \times aq \times aq^2 \times aq^3 \times aq^4 = a^5 q^{10} = 243 \rightarrow \sqrt[5]{a^5 q^{10}} = \sqrt[5]{243} = 3 = aq^2$ (ب)

$a \times a \times q^4 = a^2 q^4 \rightarrow (aq^2)^2 = (3)^2 \rightarrow aq^2 = 3$ (ج)

$\frac{a}{q}, a, aq$
 $r^b = \frac{r\sqrt{r}}{q}$
 $r^a = r\sqrt{r}q$
 $q = \frac{r^a}{r\sqrt{r}}$
 $\frac{r\sqrt{r}}{r^b} = \frac{r^a}{r\sqrt{r}}$
 $r^{a+b} = r^2$
 $a+b = 2$
 $\frac{a+b}{2} = \frac{2+2}{2} = 2$ (د)

$aq^2 = 1-x$
 $aq^4 = x$
 $aq^{10} = x+1$
 $\frac{a_{11}}{a_9} = \frac{a_{10}}{a_8} \Rightarrow \frac{x+1}{x} = \frac{x}{1-x}$
 $x^2 = -(x+1)(x-1) = -x^2 + 1 = 1 - x^2 = x^2$
 $1 = 2x^2$
 $x^2 = \frac{1}{2}$
 $x = \pm \sqrt{\frac{1}{2}} = \pm \frac{1}{\sqrt{2}}$ (ه)

لایه مزروعی

$$q = \frac{1}{3} \rightarrow a = 27 \text{ - نزديك}$$

$$q = 3 \rightarrow a = 1 \rightarrow \text{بزرگتر} = 27$$

$a + aq^r = 11$ $aq + aq^r = 11$ $1 + q^r = (1+q)(1-q+q^r)$ $\frac{(1+q)(1-q+q^r)}{q(1+q)} = \frac{11}{3} \rightarrow 3q = 3q^r - 3q + 3 \rightarrow 3q^r - 10q + 3 = 0$	$\frac{a(1+q^r)}{aq(1+q)} = \frac{11}{11} = \frac{1}{3}$ $\boxed{27} \text{ rrr}$ $\frac{-b \pm \sqrt{\Delta}}{2a} = \frac{10 \pm \sqrt{49}}{4}$ $= \frac{10 \pm 7}{4} = \frac{1}{3} \text{ or } \frac{3}{1}$	6
$a \times aq \times aq^r = a^3 q^r = 27 \rightarrow aq = 3 \rightarrow a = \frac{3}{q}$ $a + aq + aq^r = 13 \rightarrow a(1+q+q^r) = 13$ $\frac{3}{q}(1+q+q^r) = 13$ $3 + 3q + 3q^r = 13q$ $3q^r - 10q + 3 = 0 \rightarrow q = \frac{10 \pm 1}{4} = \frac{1}{3} \text{ or } 3$	$q = 3 \rightarrow a_1 = 1$ $a_r = 3$ $a_{13} = 9$ $q = \frac{1}{3} \rightarrow a_1 = 9$ $a_r = 3$ $a_{13} = 1$	7
$a \left(\frac{q^n - 1}{q - 1} \right) = 2 \left(\frac{3^{10} - 1}{3 - 1} \right) = 3^{10} - 1$ $1 + 3 + \dots + 9 = 45$ $a^{10} q^{45} = \boxed{3^{10} \times 3^{45}}$	(الف) (ب)	8
a, aq, aq^r, aq^r $\begin{matrix} \xrightarrow{\times q} & \xrightarrow{\times q} & \xrightarrow{\times q} \end{matrix}$ $aq - a, aq^r - aq, aq^r - aq^r$ $a(q-1), aq(q-1), aq^r(q-1)$ $\begin{matrix} \xrightarrow{\times q} & \xrightarrow{\times q} \end{matrix} \Rightarrow$	$q = q'$ فرض است که دو q و q' برابر است.	9
$a_1, a_2, \dots, a_n$ $a_n = a \times q^{n-1}$ $S_n = a + aq + aq^r + aq^r + \dots + aq^{n-1}$ $q \times S_n = aq + aq^r + aq^r + \dots + aq^n$ $S_n - qS_n = a - aq^n$ $S_n(1-q) = a(1-q^n)$ $S_n = a \left(\frac{1-q^n}{1-q} \right) = a \left(\frac{q^n - 1}{q - 1} \right)$	$a_1, a_2, a_3, \dots, a_n$ $a_n = a_1 + (n-1)d$ $S_n = a_1 + a_2 + \dots + a_{n-1} + a_n$ $S_n = a_n + a_{n-1} + \dots + a_2 + a_1$ $2S_n = n(a_1 + a_n) \rightarrow a_1 + a_n = a_2 + a_{n-1} = a_3 + a_{n-2}$ $S_n = \frac{n}{2}(a_1 + a_n) = \frac{n}{2}(a_1 + a_1 + d(n-1))$	(الف) (ب) 10

$$S_n = a \left(\frac{1-q^n}{1-q} \right) = a \left(\frac{q^n - 1}{q - 1} \right)$$

$$(2a_1 + (n-1)d)$$