

نام و نام خانوادگی با شماره پاسخنامه تشریحی تکلیف شماره ۱۲ کلاس (مهر خرداد ۱۳۹۷)

الف) $\frac{1}{r}, \frac{1}{r^2}, \frac{1}{r^3}, \dots \rightarrow q = r$ $a_n = \frac{1}{r} (r)^{n-1} \rightarrow a_{10} = \frac{1}{r} (r)^9 \rightarrow r^8 = 256$

ب) $r = \frac{1}{r} \times n \rightarrow \frac{1}{r} \times r^9 = 1$ $\frac{a_{10}}{a_1} = \frac{a_1 r^9}{a_1} \rightarrow r^9 = 1$ $r = 1$

ج) $(a_1 r^9)(a_1 r^9) = r^2 \rightarrow r^2 = r^{10} \rightarrow r^8 = 1$ $r = 1$

د) $\frac{1}{r} \times r^{n-1} = 1 \rightarrow r^{n-1} = 1$ $r^{n-1} = 256 \rightarrow r^{n-1} = (r^2)^8 \rightarrow r^{n-1} = 2^{16}$

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$a_1 r^9 = 12$ $a_1 r^9 = 94$ $\frac{a_1 r^9}{a_1 r^9} \rightarrow r^9 = 1 \rightarrow r = 1$

$a_1 (r)^9 = 12 \rightarrow a_1 = \frac{12}{14} = \frac{6}{7}$ $a_n = \frac{6}{7} (r)^{n-1} \rightarrow a_{10} = \frac{6}{7} (r)^9$

$= 3 \times r^9 = 3 \times 14 = 42$

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الف) $\frac{a_3}{q^2} \times \frac{a_5}{q} \times a_7 \times a_9 q \times a_{11} q^2 \rightarrow a_{11} = r^{10} \rightarrow a_{11} = 256$

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$a_1 \times a_{11} \rightarrow \frac{a_{11}}{q^2} \times a_7 q^2 \rightarrow a_7^2 \rightarrow 9$

$\frac{r^2 r}{r^a} = \frac{r^b}{r^2 r} \rightarrow r^{a+b} = r^5 \rightarrow a+b = 5$

ب) $\frac{a+b}{r} \rightarrow \frac{5}{r} = 1$ $r = 5$

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$\frac{a_v}{a_w} = \frac{n}{1-n} \rightarrow q^r$ $\frac{a_{11}}{a_v} = \frac{n+1}{n} \rightarrow q^r$ $\rightarrow \frac{n+1}{n} = \frac{n}{1-n}$

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$\rightarrow n^2 (1-n)(n+1) = 1-n^2$

$\rightarrow n^2 = 1 \rightarrow n = 1$ $\rightarrow \frac{n+1}{n} = \frac{2}{1} = 2$

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$\pm \frac{\sqrt{r}}{r}$

برای $\frac{a_{11}}{a_v} = q^r$ عددی مثبت مرشد $n = -\frac{\sqrt{2}}{2}$ حاصل
در صورتی که q قطعاً نامنفی است پس $n = -\frac{\sqrt{2}}{2}$ غیر قابل قبول است

$\frac{a_1 + a_1 r^n}{a_1(1+r^n)} = \frac{21}{1}$ $\frac{a_1 r + a_1 r^2}{a_1 r(1+r)} = \frac{12}{1}$ $\rightarrow \frac{a_1(1+r^n)}{a_1 r(1+r)} = \frac{21}{12} = \frac{7}{4}$ $\rightarrow \frac{(1+r^n)(1-r+r^2)}{r(1+r)} = \frac{7}{4} \rightarrow 4(1-r+r^2) = 7r \rightarrow 4r^2 - 10r + 4 = 0$ $\rightarrow r = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \rightarrow \frac{10 \pm \sqrt{100 - 64}}{8} \rightarrow \frac{10 \pm 6}{8}$ $r = \frac{16}{8} = 2 \text{ or } r = \frac{4}{8} = \frac{1}{2}$ $a_1 + a_1 q + a_1 q^2 = 12 \rightarrow \frac{12}{q} + 12 + 12q = 12 \rightarrow \frac{12}{q} + 12q = 0 \rightarrow q = 2$ $a_1 \times a_1 q \times a_1 q^2 = 27 \rightarrow a_1^3 q^3 = 27 \rightarrow (a_1 q)^3 = 27 \rightarrow a_1 q = 3 \rightarrow \text{جواب}$ $\frac{12}{q} + 12 + 12q = 12 \rightarrow 12q^2 - 10q + 4 = 0 \rightarrow q = 2$ $\text{جواب} \rightarrow 1, 2, 9, \dots$ $q = \frac{1}{2} \rightarrow \text{جواب: } 9, 2, 1$	6
$S_{10} = a_1 \left(\frac{q^{10} - 1}{q - 1} \right) \rightarrow \frac{1}{q} \left(\frac{q^{10} - 1}{q - 1} \right) \rightarrow \frac{q^{10} - 1}{q - 1} \rightarrow 29041$ $a_n = 2 \left(\frac{1}{2} \right)^{n-1} \rightarrow a_{10} = 2 \times \frac{1}{2^9}$ $\text{جواب: } (a_1 \times a_{10})^{\frac{n}{2}} \rightarrow \left(2 \times \frac{1}{2^9} \right)^5 \rightarrow \left(\frac{2}{2^9} \right)^5 = \frac{2^5}{2^{45}} = \frac{1}{2^{40}}$	7
$a_1, a_1 q, a_1 q^2, a_1 q^3, a_1 q^4, \dots$ $\frac{a_2 - a_1}{a_1 q - a_1}, \frac{a_3 - a_2}{a_1 q^2 - a_1 q}, \frac{a_4 - a_3}{a_1 q^3 - a_1 q^2}, \frac{a_5 - a_4}{a_1 q^4 - a_1 q^3}$ $\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$ $a_1(q-1), a_1 q(q-1), a_1 q^2(q-1), a_1 q^3(q-1)$ $\times q \quad \times q \quad \times q \rightarrow q^4$	8
$a_n = a_1 + (n-1)d$ $a_1 + (a_1 + d) + (a_1 + 2d) + \dots + (a_1 + (n-1)d)$ $\rightarrow n a_1 + \frac{n(n-1)}{2} d \rightarrow \frac{n}{2} (2a_1 + (n-1)d)$ $S_n = a_1 + a_2 + a_3 + \dots + a_{n-1} + a_n$ $q S_n = a_2 + a_3 + \dots + a_n + a_{n+1}$	9
$q S_n - S_n \rightarrow (q-1) S_n = a_{n+1} - a_1 \rightarrow a(q^n - 1)$ $S_n = \frac{a(q^n - 1)}{q - 1}$	10

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