

الف) $q = r = r$

$a_{10} = \frac{1}{r} \times r^9 = \frac{1}{r} \times 12 = 129$

ب) $\frac{a_{14}}{a_{12}} = \frac{r^{14}}{r^{12}} = r^2 = 19$

$a_{14} = \frac{1}{r} \times r^{14} = r^{13}$

$a_{12} = \frac{1}{r} \times r^{12} = r^{11}$

ج) $aq^r = \frac{1}{r} \times r^r = r^r = r^2 \Rightarrow r \times 129 \rightarrow r^1 \times r^2 = r^3 = r^0 \Rightarrow \sqrt[3]{r^3} = r = 129$

$aq^9 = \frac{1}{r} \times r^9 = 129$

د) $\frac{1}{r} \times r^{n-1} = 129 \rightarrow r^{n-1} = 129 \rightarrow r^{n-1} = r^9 \rightarrow n-1=9 \rightarrow n=10$

$a_{10} = 12 \rightarrow aq^9 = 12$ $\frac{aq^9}{aq^0} = \frac{12}{12} \rightarrow q^9 = 1 \rightarrow q = 1$ $a_{10} = 129 \times 12$ $\frac{a_{10}}{r^9} = \frac{129}{r^9} = 12$

$a_{10} = 129 \rightarrow aq^9 = 129$

$a_{10} = a \times q^9 = \frac{1}{r} \times r^9 = r^8 \times r^9 = r^{17} = 129$

$a_{10} = a \times q^9 = \frac{1}{r} \times r^9 = r^8 \times r^9 = r^{17} = 129$

الف) $a \times a \times a \times a \times a = a^5 = r^5 \rightarrow a = r$

$a_r = r$

ب) $a \times a = \frac{a}{r} \times r^2 = a^2 = r^2 \times 9$

$r^a, \sqrt{r}, r^b$

$r^a \times r^b = r^r \rightarrow r^{a+b} = r^r \rightarrow \frac{a+b}{r} = \frac{r}{r} = 1$

$q, a, a \rightarrow x+1, x, 1-x$

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

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

$\frac{2x^2}{r} = 1 \rightarrow x = \pm \frac{\sqrt{r}}{r}$

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برای $x = -\frac{\sqrt{r}}{r}$ حاصل $\frac{a_{11}}{a_1} = q^x$ عددی مثبت مرشد
در صورتی که x مقادیر نامتناهی است پس $x = -\frac{\sqrt{r}}{r}$ غیر قابل قبول است

ج) $a_1 + a_2 = 12 \rightarrow ar^0 + ar^1 = 12$

$a_2 + a_3 = 12 \rightarrow ar^1 + ar^2 = 12$ $\frac{x(-1)}{r} \rightarrow ar^2 = -12$

د) $a + a_2 + a_3 = 12 \rightarrow a + a_2 = 10 \rightarrow a + ar^2 = 10$

$a \times a_2 \times a_3 = 12 \rightarrow a \times ar^1 \times ar^2 = a^3 r^3 = 12 \times 12 \rightarrow a^3 = 12$

الف) $q=3$ $S_{10} = q \left(\frac{q^{10}-1}{q-1} \right) = 3 \left(\frac{3^{10}-1}{3-1} \right) = 3 \left(\frac{59048}{2} \right) = 88572$

ب) $a, ar, ar^2, ar^3, \dots \rightarrow (a, ar)^\infty = (a, ar)^\infty = (r \times r^9)^\infty = (r^{10})^\infty = (3^{10})^\infty = 59048$

$a, ar, ar^2, ar^3, \dots$

$a - ar, ar - ar^2, ar^2 - ar^3, \dots$

$\frac{ar(1-r)}{a(1-r)} = r$

$a(1-r), ar(1-r), ar^2(1-r), \dots$

الف) $S_n = a + a + d + a + r d + \dots + a + (n-2)d + a + (n-1)d$
 $+ S_n = a + (n-1)d + a + (n-2)d + \dots + a + r d + a + d + a$

$r S_n = r a + (n-2) r d + r a + (n-1) r d + \dots$

$S_n = \frac{n(r a + (n-1) d)}{2}$

ب) $S_n = a + aq + aq^2 + \dots + aq^{n-1}$
 $- q S_n = aq + aq^2 + \dots + aq^{n-1} + aq^n$

$S_n - q S_n = a - aq^n \Rightarrow S_n = \frac{a(1-q^n)}{1-q}$

راه حل تستی سوال 9

$a, aq, aq^2, aq^3, aq^4, \dots, aq^{n-2}, aq^{n-1}$
 $aq - a, aq^2 - aq, aq^3 - aq^2, aq^4 - aq^3, \dots, aq^{n-1} - aq^{n-2}$
 $a(q-1), aq(q-1), aq^2(q-1), aq^3(q-1), \dots, aq^{n-2}(q-1)$

مساعده مهوود $a(q-1)$ است دعيات در q ضرب مهوود

كيب قدر نيت q است

سوال ۷

$$a_1 = \frac{a}{q}$$

$$ar = a$$

$$ar^2 = aq$$

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$$\frac{a}{q} \times a \times aq = 27 \rightarrow ar^2 = 27 \rightarrow \underline{a = 3}$$

$$\text{if } a = r \rightarrow \frac{r}{q} + r + r^2 = 12 \rightarrow r^2 - 1 \cdot q + r = 0$$

$$\Delta \rightarrow \frac{1 \pm \sqrt{1 - 4}}{4} = \frac{1 \pm 1}{4} \rightarrow \begin{matrix} r \\ \frac{1}{r} \end{matrix}$$

$$q = r \rightarrow \text{مقدار} = 1, 3, 9$$

$$q = \frac{1}{r} \rightarrow \text{مقدار} = 9, r, 1$$

سوال ۶

$$\begin{matrix} a + ar^2 = 21 \\ aq + ar^2 = 12 \end{matrix} \rightarrow \frac{a(1+q^2)}{aq(1+q)} = \frac{(q^2 - q + 1)}{q} = \frac{21}{12}$$

$$r^2q^2 - rq + r = 21q \rightarrow r^2q^2 - 1 \cdot q + r = 0 \xrightarrow{\text{مقدار}} q^2 - 1 \cdot q + 1 = 0$$

$$q = \frac{1}{r} \leq q = \frac{1}{r}$$

$$q = r \rightarrow a(1+27) = 21 \rightarrow a = 1 \rightarrow 1, r, 9, 27$$

$$q = \frac{1}{r} \rightarrow \frac{a}{r} + \frac{a}{q} = 12 \rightarrow \frac{4a}{a} = 12 \rightarrow a = 27$$

$$27, 9, r, 1 \rightarrow \text{max مقدار} \rightarrow 27$$