

نام و نام خانوادگی: (آرژانتین) لیسری وانی فر پاسخنامه تشریحی تکلیف شماره ۱۲ کلاس: (دفعه) لیسریانه B

$$a_n = \frac{1}{2}, 1, 2, \dots \rightarrow q = 2 \quad a_{10} = a_1 q^9 = \frac{1}{2} \times 2^9 = 2^8 = 256 \quad (\text{الف})$$

$$\frac{a_{14}}{a_{13}} = \frac{a_1 q^{14}}{a_1 q^{13}} = q = 2^8 = 16 \quad (\text{ب})$$

$$a_8 = a_1 q^7, a_{10} = a_1 q^9 \rightarrow \sqrt{a_8 \cdot a_{10}} = a_9 = a_1 q^8 = \frac{1}{2} \times 2^8 = 2^7 = 128 \quad (\text{ج})$$

$$128 = a_1 q^{n-1} \rightarrow 128 = \frac{1}{2} \times 2^{n-1} \rightarrow 2^7 = 2^{n-2} \rightarrow n-2 = 7 \rightarrow n = 9 \quad (\text{د})$$

$$\left. \begin{array}{l} a_1 = 94 \\ a_5 = 12 \end{array} \right\} \xrightarrow{\frac{a_1}{a_5}} \frac{a_1 q^4}{a_1 q^5} = \frac{94}{12} \rightarrow q^2 = 1 \rightarrow q = 2$$

$$a_{10} = a_1 \cdot q^9 = 94 \times 2^9 = 31136$$

$$a_1 \times a_2 \times a_3 \times a_4 \times a_5 = 2^4 \times 3^5 \rightarrow (a_3)^5 = 2^4 \times 3^5 \rightarrow a_3 = 3$$

$$a_4 = a_3 \cdot a_5$$

$$a_1 \times a_5 = a_3 \cdot a_3 = 3 \times 3 = 9 \quad (\text{ب})$$

$$2^a, 2\sqrt{2}, 2^b \rightarrow (2\sqrt{2})^2 = 2^a \cdot 2^b \rightarrow 32 = 2^{a+b}$$

$$a+b=5$$

$$\text{درج واسطی} = \frac{a+b}{2} = \frac{5}{2} = 2,5$$

$$a_{11} \cdot a_3 = a_7 \cdot a_7 \rightarrow (n+1)(1-n) = n^2$$

$$a_3 = 1-n$$

$$a_7 = n$$

$$a_{11} = n+1$$

$$1-n^2 = n^2 \rightarrow 2n^2 = 1$$

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

$$n = \pm \frac{\sqrt{2}}{2}$$

نسبت a_7 و a_3 میان q^4 همواره مثبت باشد. q^4 متغیر قابل قبول چون در دنباله هندسی n نمی باشد. $n = \frac{\sqrt{2}}{2}$ غیر قابل قبول چون در دنباله هندسی n نمی باشد.

$$\frac{t_7}{t_3} = q^4 \rightarrow \frac{-\frac{\sqrt{2}}{2}}{1 - (-\frac{\sqrt{2}}{2})} = \frac{-\frac{\sqrt{2}}{2}}{1 + \frac{\sqrt{2}}{2}} = -1$$

$$\left. \begin{aligned} a_2 + a_3 &= aq(1+q) = 12 \\ a_1 + a_3 &= a(1+q^2) = 21 \end{aligned} \right\} \rightarrow \frac{a(1+q^2)}{aq(1+q)} = \frac{21}{12} = \frac{7}{4} = \frac{(1+q)(q^2+q+1)}{q(1+q)} = \frac{q^2+q+1}{q}$$

$$Vq = 3q^2 - 3q + 3 \rightarrow 3q^2 - 10q + 3 = 0 \rightarrow q = \frac{10 \pm \sqrt{100-36}}{6} = \frac{10 \pm 8}{6}$$

if $q=3 \rightarrow a=1 \rightarrow a_n = 1, 3, 9, 27, \dots$
 if $q=\frac{1}{3} \rightarrow a=27 \rightarrow a_n = 27, 9, 3, 1, \dots$

مقدار است پس جواب (27) است.

$$a_1 \cdot a_2 \cdot a_3 = 27 \rightarrow a_2 \cdot a_3 = 27 \rightarrow a_2 = 27 \rightarrow a_1 = 3$$

$$a_1 + a_2 + a_3 = 13 \rightarrow a_1 + a_3 = 10 \rightarrow 3 + a_3 = 10 \rightarrow a_3 = 7$$

$$a_1 \times a_3 = 9$$

$$\frac{a_2}{q} + a_2 + a_2 q = 13 \rightarrow \frac{3}{q} + 3 + 3q = 13 \rightarrow \frac{3q^2 + 3q + 3}{q} = 13$$

if $q=3 \rightarrow a_1=1 \rightarrow a_n = 1, 3, 9$ ✓
 if $q=\frac{1}{3} \rightarrow a_1=9 \rightarrow a_n = 9, 3, 1$ ✓

جواب: $a_n = 1, 3, 9, 27, \dots$ $\rightarrow q=3$

$$S_{10} = a_1 \left(\frac{q^{10} - 1}{q - 1} \right) = 1 \left(\frac{3^{10} - 1}{3 - 1} \right) = \frac{3^{10} - 1}{2} = 59049 \quad (الف)$$

$$P_{10} = \sqrt{(a_1 \times a_{10})^{10}} = (a_1 \times a_{10})^5 = (1 \times 3^9)^5 = 3^{45} \quad (ب)$$

$a_n = \frac{a}{q}, a, aq, aq^2, aq^3, \dots$ $a_2 = a_1 \cdot a_3$ انبساط همنسای بودن

$$\rightarrow a - \frac{a}{q}, aq - a, aq^2 - aq, aq^3 - aq^2 \rightarrow aq^2(q-1)^2 = \frac{a}{q}(q-1) \cdot aq(q-1)$$

$\left(\frac{a}{q}\right)(q-1), a(q-1), aq(q-1), aq^2(q-1)$ در 1 است.

الف) $a_n = a, a+d, a+2d, \dots, a+(n-1)d$

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

$$= na + (1+2+3+\dots+(n-1))d = na + \frac{(n-1+1)(n-1)}{2}d = na + \frac{n(n-1)}{2}d$$

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

ب) $a_n = a, aq, aq^2, \dots, aq^{n-1}$

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

طرفین را q ضرب $\rightarrow S_n \cdot q = aq + aq^2 + aq^3 + \dots + aq^n$

$$S_n - S_n \cdot q = a - aq^n = a(1 - q^n)$$

$$S_n(1 - q) = a(1 - q^n) \rightarrow S_n = \frac{a(1 - q^n)}{(1 - q)} = a \times \frac{(q^n - 1)}{(q - 1)}$$