

گروه: دهم لیسنج

سری: ۱۴

نام و نام خانوادگی: تانیا ترک تری

$$a_n = \frac{1}{r}, 1, 2 \Rightarrow q = 2 \quad t_n = \frac{1}{r} \times 2^{n-1}$$

$$t_{10} = \frac{1}{r} \times 2^9 = 256 \quad \text{الف)}$$

$$\frac{a_{14}}{a_{13}} = \frac{aq^{14}}{aq^{13}} \Rightarrow \frac{\frac{1}{r} \times 2^{14}}{\frac{1}{r} \times 2^{13}} = 2^1 = 2 \quad \text{ب)}$$

$$t_4 = aq^4 \Rightarrow \frac{1}{r} \times 16 = 4 \quad t_{10} = 256$$

$$q^{k+1} = \frac{b}{a} \Rightarrow \frac{256}{4} = 64 \Rightarrow q^2 = 64 \Rightarrow q = \pm 8 \quad \text{ج)}$$

$$\frac{1}{r} \times 2^{n-1} = 128 \Rightarrow 2^{n-1} = 256 \Rightarrow n = 9 \quad \text{د)}$$

$$a_1 = 12$$

$$aq^4 = 12$$

$$\frac{aq^1}{aq^4} = \frac{99}{12} \Rightarrow q^3 = 1 \Rightarrow q = 1, a = \frac{r}{f}$$

$$a_1 = 99$$

$$aq^4 = 99$$

$$a_{10} = ?$$

$$a_{10} = aq^9 \Rightarrow \frac{r}{f} \times 2^9 = 384$$

$$a_1 \times a_2 \times a_3 \times a_4 \times a_5 = 243$$

$$(a_3)^5 = 243 \Rightarrow a_3 = 3 \quad \text{الف)}$$

$$a_1 \times a_5 = (a_3)^2 \Rightarrow 3 \times 3 = 9 \quad \text{ب)}$$

$$(\sqrt{r})^r = r^a \times r^b \Rightarrow \sqrt{r} = r^{a+b} \Rightarrow a+b = \frac{1}{2}$$

$$\frac{a+b}{r} \Rightarrow \frac{1}{r} = 1/2$$

$$a_r = x+1$$

$$b^r = ac \Rightarrow (x)^r = (x+1)(1-x) \Rightarrow x^r = x - x^r + 1 - x \Rightarrow$$

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

$$a_j = x$$

$$a_{11} = 1-x$$

د

$$a_1 + a_r = 21$$

$$a_r + a_r = 12$$

$$a + aq^r = 21$$

$$aq + aq^r = 12$$

$$\Rightarrow \frac{a(1+q^r)}{aq(1+q)} = \frac{21}{12} \Rightarrow \frac{(1+q)(1-q+q^r)}{q(1+q)} = \frac{7}{4} \Rightarrow$$

$$\frac{1-q+q^r}{q} = \frac{7}{4} \Rightarrow 4q = 4 - 4q + 4q^r \Rightarrow 4q^r - 8q + 4 = 0 \Rightarrow (q-1)(q-3) = 0 \Rightarrow q=1 \text{ or } q=3$$

$$\textcircled{1} q=1 \Rightarrow a_1=1, a_r=3, a_r=a, a_1=21 \Rightarrow a_1+a_r=22 \neq 21 \times \textcircled{2} q=3 \Rightarrow a_1=21, a_r=9, a_r=3, a_1=1, a_1+a_r=22 \checkmark$$

$$a_1 + a_r + a_r = 12$$

$$a_1 \times a_r \times a_r = 21$$

$$\frac{a}{q} \times a \times aq = a^3 = 21 \Rightarrow a=3$$

$$\frac{3}{q} + 3 + 3q = 12 \Rightarrow \frac{3}{q} + 3q = 9 \Rightarrow 3q^2 - 10q + 3 = 0 \Rightarrow$$

$$q^2 - 10q + 9 = 0 \Rightarrow (q-1)(q-9) = 0 \Rightarrow q=1 \text{ or } q=9 \Rightarrow \frac{3}{1}, 3, 3 \times \frac{1}{3} = 9, 3, 1$$

$$q=9 \Rightarrow \frac{3}{9}, 3, 3 \times 9 = 1, 3, 9$$

$$a_n = 2, 4, 18, \dots \Rightarrow q=3$$

$$a_n = 2 \times 3^{n-1}$$

$$S_n = a_1 \left(\frac{q^n - 1}{q - 1} \right) \Rightarrow 2 \left(\frac{3^n - 1}{3 - 1} \right) \Rightarrow 2 \left(\frac{3^n - 1}{2} \right) \Rightarrow 3^n - 1 = 29 \Rightarrow n=4$$

(الف)

$$P = (x^2 + x^4) \cdot \frac{n}{r} \Rightarrow (x^2 + x^4) \cdot \frac{n}{r} \Rightarrow (x^2 + x^4) \cdot \frac{n}{r} = x^2 \cdot x^4 \cdot \frac{n}{r}$$

(ب)

$$a_n = 2, 4, 18, 24, 48, \dots \rightarrow -2, -4, -18, -24, \dots \Rightarrow q' = +2 \Rightarrow q = q'$$

$$a_n = 1, 4, 16, 64, 256, \dots \rightarrow -1, -4, -16, -64, \dots \Rightarrow q' = 4 \Rightarrow q = q'$$

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

$$S_n = a_1 + a_r + a_{r+1} + \dots + a_{n-r} + a_{n-1} + a_n \textcircled{1}$$

(الف)

$$a_r = a_1 + d$$

$$S_n = a_n + a_{n-1} + a_{n-2} + \dots + a_r + a_{r+1} + a_1 \textcircled{2}$$

$$a_{n-1} = a_n - d \leq a_1 + (n-r)d$$

$$S_n + S_n = (a_1 + a_n) + (a_r + a_{n-1}) + \dots + (a_{n-1} + a_r) + (a_n + a_1)$$

$$2S_n = n(a_1 + a_n) \Rightarrow S_n = \frac{n}{2} (a_1 + a_n) \Rightarrow$$

$$\frac{n}{2} (a_1 + [a_1 + (n-1)d]) \Rightarrow \frac{n}{2} (2a_1 + (n-1)d)$$

$$S_n = a_1 + a_1q + a_1q^2 + \dots + a_1q^{n-2} + a_1q^{n-1}$$

(ب)

$$qS_n = a_1q + a_1q^2 + \dots + a_1q^{n-1} + a_1q^n \textcircled{3}$$

$$\Rightarrow S_n - qS_n = a_1 + 0 + 0 + \dots + 0 - a_1q^n \Rightarrow a_1 - a_1q^n \Rightarrow S_n = a_1 \times \frac{1-q^n}{1-q}$$