

Subject.....

Day..... Month..... Year.....

$$1. a_1 = \frac{1}{r}, q = 2$$

$$3. \text{الف) } a_9 = \frac{1}{r} \times 2^9 = 256$$

$$5. \text{ب) } \frac{a_{14}}{a_{13}} = q^{14-13} = q^1 = 2^1 = 2$$

$$7. \text{ج) } b^2 = ac \Rightarrow \sqrt{2 \times 256} = \sqrt{r^4} = r^2 = 32$$

$$9. \text{د) } a_n = a_1 q^{n-1} \Rightarrow 128 = \frac{1}{r} \times 2^{n-1} \Rightarrow 256 = 2^{n-1}$$

$$11. \Rightarrow n-1=8 \Rightarrow n=9$$

$$13. q^{n-m} = \frac{a_n}{a_m} \Rightarrow q^{1-5} = \frac{96}{12} \Rightarrow q^4 = 8 \Rightarrow q = 2$$

$$15. a_n = a_m \times q^{n-m} \Rightarrow a_1 = a_5 \times 2^{1-5} \Rightarrow a_1 = 96 \times 2 = 192$$

$$17. \frac{a_2}{q^2} \times \frac{a_2}{q} \times a_2 \times (a_2 \times q) \times (a_2 \times q^2) = a_2^5 = 243 \Rightarrow a_2 = 3$$

$$19. \text{الف) } \Rightarrow a_2 = 3$$

$$21. \text{ب) } \frac{3}{q^2} \times (3 \times q^2) = 9$$

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$$r\sqrt{r} = r^{\frac{\Delta}{r}}, b^r = ac$$

$$\Rightarrow (r^{\frac{\Delta}{r}})^r = r^a \times r^b \Rightarrow r^{\Delta} = r^a \times r^b \Rightarrow a+b=\Delta$$

$$\frac{a+b}{r} = \frac{\Delta}{r}$$

$$11 - v = r \quad v - r = r$$

$$\Rightarrow x^r = (1-x)(x+1) \Rightarrow x^r = 1 - x^r \Rightarrow x = \pm \sqrt{\frac{1}{r}}$$

$$\Rightarrow \frac{1}{\sqrt{r}} \times \frac{\sqrt{r}}{\sqrt{r}} = \frac{\pm \sqrt{r}}{r}$$

$$a_1 + aq^r = r\lambda \Rightarrow a(1+q^r) = r\lambda$$

$$aq + aq^r = r\lambda \Rightarrow aq(1+q) = r\lambda$$

$$\frac{a_1(1+q^r)}{aq(1+q)} = \frac{r\lambda}{r\lambda} \Rightarrow \frac{(1+q)(1-q+q^r)}{q(1+q)} = \frac{v}{r}$$

$$\Rightarrow r(1-q+q^r) = vq \Rightarrow r - rq - rq^r = vq$$

$$\Rightarrow rq^r - 1 \cdot q + r = 0 \Rightarrow q = \frac{-1 \pm \sqrt{1-4r}}{r}$$

$$\begin{cases} q=r \Rightarrow ra_1(1+r) = r\lambda \Rightarrow a_1 = 1 \end{cases}$$

$$\begin{cases} q = \frac{1}{r} \Rightarrow a_1 q(1+q) = r\lambda \Rightarrow a_1 = r\lambda \end{cases}$$

$$q=r \Rightarrow 1, r, q, (r\lambda), q = \frac{1}{r} \Rightarrow (r\lambda), q, c, 1$$

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$$\frac{a_1}{q} \times a_p \times a_p q = 12 \Rightarrow a_p^3 = 12 \Rightarrow a_p = \sqrt[3]{12} \quad a_1 = \frac{12}{q} \quad (V)$$

$$\Rightarrow a_1 + a_p + a_p q = 12 \xrightarrow{a_p = \sqrt[3]{12}} a_1 + a_p = 1.$$

$$\Rightarrow a_1 (1 + q^2) = 12 \Rightarrow \left(\frac{12}{q}\right) (1 + q^2) = 12$$

$$\Rightarrow \left(\frac{12}{q}\right) \left(\left(\frac{12}{q} \times 1\right) + \left(\frac{12}{q} \times q^2\right)\right) = 12$$

$$\Rightarrow \frac{12}{q} + 12q = 12 \xrightarrow{\times q} 12 + 12q^2 = 12q$$

$$\Rightarrow 12q^2 - 12q + 12 = 0 \Rightarrow q = \frac{1 \pm 1}{2} \quad \begin{cases} \sqrt[3]{12} \\ \frac{1}{\sqrt[3]{12}} \end{cases}$$

$$q = \sqrt[3]{12} \rightarrow 1, \sqrt[3]{12}, 12$$

$$q = \frac{1}{\sqrt[3]{12}} \rightarrow \frac{1}{12}, \sqrt[3]{12}, 1$$

$$S_1 = \sum_{k=1}^{\infty} \left(\frac{12^k - 1}{12^k - 1} \right) = 89.21 \quad (A)$$

$$b) P_n = (a_1 + a_n)^n \quad \begin{array}{l} \text{اما } a_n \text{ اندازير} \\ \text{روى سجد اول امتحان كنير} \end{array} \rightarrow P_n = a_1^n \times q^{\frac{n(n-1)}{2}}$$

$$\Rightarrow 12^1 \times 12^{\frac{1(1-1)}{2}} = 12^1 \times 12^0 \Rightarrow 12 \times 1 = 12$$

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$$A = a_1, a_1q, a_1q^2, \dots, a_1q^{n-1}$$

(9)

$$B \rightarrow b_1 = a_2 - a_1 = a_1q - a_1$$

$$b_r = a_r - a_{r-1} = a_1q^{r-1} - a_1q^{r-2} \Rightarrow b_n = a_n - a_{n-1} = a_1q^{n-1} - a_1q^{n-2}$$

$$\left[\frac{b_r}{b_1} = \frac{b_r}{b_r} \Rightarrow \frac{a_1q^{r-1}}{a_1q^{r-2}} = q \right] \quad \left[\frac{b_r}{b_r} = q \right]$$

نسبت متوالی هندسی = q ✓

$$\text{الف)} S_n = a_1 + (a_1 + d) + (a_1 + 2d) + \dots + (a_1 + (n-1)d)$$

(1)

یا برعکس
(تردیب)

$$S_n = a_n + (a_n - d) + (a_n - 2d) + \dots + (a_1 + d) + a_1$$

(2)

$$\Rightarrow S_n = (a_1 + (n-1)d) + (a_1 + (n-2)d) + \dots + a_1$$

(3)

$$\text{د)} \Rightarrow 2S_n = \underbrace{(2a_1 + (n-1)d)}_{\text{جفت}} + \underbrace{(2a_1 + (n-1)d)}_{\text{جفت}} + \dots$$

تا جفت بار میسر

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

$$\Rightarrow S_n = \frac{n}{2} (2a_1 + (n-1)d)$$



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$$1 \quad \text{ب) } S_n = a_1 + a_1 r + a_1 r^2 + \dots + a_1 r^{n-1} \quad (1)$$

$$3 \quad \times r \rightarrow r S_n = ar + ar^2 + ar^3 + \dots + ar^n \quad (2)$$

$$5 \quad (1) - (2) \quad S_n - r S_n = a - ar^n$$

$$7 \quad \Rightarrow S_n(1-r) = a(1-r^n) \Rightarrow S_n = a \frac{1-r^n}{1-r}$$