

الف) $aq^{n-1} = \frac{1}{2} \times 2^9 = 256$ ✓ ب) $\frac{a_{17}}{a_{13}} = q^4 = 2^4 = 16$ ✓

ج) $a_8 \times a_{11} = a_9^2 \Rightarrow aq^7 \times aq^10 = a^2 q^{17} \Rightarrow \sqrt{a^2 q^{17}} = aq^8 = a_9 \rightarrow a_9 = 24$ ✓

د) $12V = aq^{n-1} \Rightarrow \frac{1}{2} \times 2^{n-1} = 121 \Rightarrow n = 9$ ✓

$\frac{a_1}{a_5} = q^4 = 1 \Rightarrow q = 1$ $a \times 2^4 = 12 \Rightarrow a = \frac{12}{16} = \frac{3}{4}$

$\frac{3}{4} \times 2^9 = 312$ ✓

(۲)

الف) $a_5 = 2 \times 3^4 \Rightarrow a_5 = 162$ ✓

ب) $a_1 \times a_9 = a_5^2 \Rightarrow a_1 \times a_9 = 81$ ✓

(۲)

$2^a \times 2^b = (2\sqrt{2})^c \Rightarrow 2^a \times 2^b = 2^c \times 2^{\frac{c}{2}} \Rightarrow 2^{a+b} = 2^{\frac{3c}{2}} \Rightarrow a+b = \frac{3c}{2}$

$\Rightarrow \frac{a+b}{c} = \frac{3}{2} = 1.5$ ✓

(۲)

$x^2 = (x+1)(1-x) \Rightarrow x^2 = x - x^2 + 1 - x \Rightarrow 2x^2 = 1 \Rightarrow x^2 = \frac{1}{2} \Rightarrow x = \pm \sqrt{\frac{1}{2}}$

(۲)

حالت
مثبت و منفی

$$\cancel{a_1} + a_1 q^n = 11 \Rightarrow \frac{a(1+q^n)}{a(q+q^n)} = \frac{11}{12}$$

$$\frac{1+q^n}{q+q^n} = \frac{11}{12} \Rightarrow q = \frac{1}{2}, a = 12 \quad \text{✓} \quad \textcircled{2}$$

$$1, 2, 4, 8, 16, 32, 64, 128$$

$$a_1 + a_2 + a_3 = 12$$

$$a_1 \times a_2 \times a_3 = 128 \Rightarrow a_2^3 = 128 \Rightarrow a_2 = 5 \quad \left. \begin{array}{l} a_1 + a_3 = 10 \\ a_1 \times a_3 = 128 \end{array} \right\}$$

$$\Rightarrow a_1 = 1$$

$$a_3 = 9$$

$$1, 5, 9 \quad \text{✓}$$

$$\textcircled{1, 100}$$

$$q = 2 \\ q = \frac{1}{2}$$

$$\text{الف) } 2 \left(\frac{2^{10} - 1}{2 - 1} \right) = 2^{10} - 1 \quad \text{✓}$$

$$\text{ب) } (a_1 \times a_{10})^9 \Rightarrow (a_1 \times a_1 \times q^9)^9 \Rightarrow (1 \times 2^9)^9 \quad \text{✓} \quad \textcircled{2}$$

$$a, aq, aq^2 \Rightarrow aq - a = a(q-1) \quad \downarrow \times q \\ aq^2 - aq = aq(q-1) \quad \downarrow \times q$$

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$$S_n = \frac{n}{2} (a_1 + a_n) \Rightarrow \frac{n}{2} (a + a + (n-1)d) \Rightarrow \frac{n}{2} (a + a_n) \Rightarrow S_n = \frac{(a + a_n) + (d_{n-1} + d_1)}{2} \times \frac{n}{2}$$

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

$$S_n = a + aq + aq^2 + \dots + aq^{n-1} = a(1 + q + q^2 + \dots + q^{n-1}) \times \frac{q-1}{q-1} = a \left(\frac{q^n - 1}{q-1} \right)$$

$$S_n q = a_1 q + a_1 q^2 + \dots + a_1 q^n$$

$$S_n q - S_n = a_1 q^n - a_1 = \frac{a_1 (q^n - 1)}{q-1}$$