

$$a_n = \frac{1}{r}, 1, 2, \dots$$

1- (2)

الف) $\rightarrow a_1 \times r^{n-1} \Rightarrow a_{10} = \frac{1}{r} \times r^9 = 256 \checkmark$ ج) $\sqrt{a_r a_{10}} = a_v \Rightarrow a_v = \frac{1}{r} \times r^7 = 22 \checkmark$

ب) $\frac{a_{1v}}{a_{1r}} = \frac{a_1 q^{1r}}{a_1 q^{1r}} = q^r = r^r = 16 \checkmark$

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

$$a_{10} = 12 \quad \frac{a_1}{a_{10}} = q^9 = \frac{96}{12} = 8 \Rightarrow q = 2$$

2- (2)

$$a_{10} = 12 \Rightarrow a_1 q^{10-1} = 12 \Rightarrow a_1 r^9 = 12 \Rightarrow a_1 = \frac{12}{r^9} \Rightarrow a_{10} = a_1 q^9 = \frac{12}{r^9} \times r^9 = 12 \checkmark$$

الف) $a_1 \times a_r \times a_{10} = 243 \Rightarrow a_r = 243 \Rightarrow a_r = \sqrt[5]{243} \Rightarrow a_r = 3 \checkmark$

3- (2)

ب) $a_1 \times a_{10} = a_r \times a_r = 3 \times 3 = 9 \checkmark$

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

4- (2)

$$\left. \begin{array}{l} a_r = 1-x \\ a_v = x \\ a_{11} = x+1 \end{array} \right\} \begin{array}{l} a_r \times a_{11} = a_v \times a_v \Rightarrow (x+1)(x-1) = x^2 \Rightarrow 1-x^2 = x^2 \\ \Rightarrow 2x^2 - 1 = 0 \Rightarrow x^2 = \frac{1}{2} \Rightarrow x = \pm \frac{1}{\sqrt{2}} \Rightarrow x = \pm \frac{\sqrt{2}}{2} \end{array}$$

5- (1, 75)

$$a_1 + a_r = 21 \rightarrow a_1 + a_1 + q^3 = 21 \Rightarrow a_1 (1+q^3) = 21 \Rightarrow a_1 (1+q)(1+q^2-q) = 21$$

$$a_r + a_v = 12 \rightarrow a_1 q + a_1 q^2 = 12 \rightarrow a_1 q (1+q) = 12 = 21$$

(2)

$$\frac{a_1 + a_r}{a_r + a_v} = \frac{1+q^3-q}{q} = \frac{21}{12} = \frac{7}{4} \Rightarrow 4q = 3 + 3q^2 - 3q$$

$$3q^2 - 4q + 3 = 0$$

$$a_1 (1+q^3) \rightarrow a_1 (1+27) = 21 \rightarrow a_1 = 1$$

$$a_1 (1+\frac{1}{q^3}) = 21 \rightarrow a_1 = 27$$

$$a_n \rightarrow 1, 3, 9, 27 \checkmark \rightarrow 27: \text{ب} \leftarrow a_r$$

$$\rightarrow 27, 9, 3, 1 \rightarrow 27: \text{ب} \leftarrow a_1$$

$$1 \rightarrow \frac{1}{27} \rightarrow \frac{1}{9} \rightarrow \frac{1}{3}$$

