

الف) $\frac{1}{2}, 1, 2, \dots$ $\Rightarrow a_1 = \frac{1}{2}, a_2 = 1, a_3 = 2$

$\Rightarrow a_1 = \frac{1}{2} \times 2^4 = 8$

سوال ج) $a_1, a_2, a_3, a_4 \rightarrow a_5 = a_1 q^4 = \frac{1}{2} \times 2^4 = 8$

سوال ب) $\frac{a_{14}}{a_{13}} = \frac{2^{14}}{2^{13}} = 2^1 = 2$

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

$a_8 = 12, a_9 = 44$ $\frac{a_9}{a_8} = q = \frac{44}{12} = \frac{11}{3}$

$\sqrt{11} = 2 \Rightarrow q = 2$ $a_1 = q^8 \times a_9 \Rightarrow a_1 = 12 \times 2^8 = 1536$

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

$a_1 \times a_5 = a_3 \times a_3 \Rightarrow a_5 = \frac{243}{a_1} \Rightarrow a_3 = 3$

ب) $a_1 \times a_5 = a_3^2 \Rightarrow 4$

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

$a_1 \times a_5 = a_3^2$ $(1+u)(1-u) = u^2$

$\Rightarrow 1-u^2 = u^2 \Rightarrow 1 = 2u^2 \Rightarrow \frac{1}{2} = u^2 \Rightarrow u = \pm \frac{\sqrt{2}}{2}$

چون صق باید غیر صق

Subject .

$$a_1 + a_2 = 1 \Rightarrow a_1 + a_1 q = 1 \quad a(1+q) = 1 \quad -9$$

$$a_2 + a_3 = 1 \Rightarrow a_1 q + a_1 q^2 = 1 \quad aq(1+q) = 1$$

$$\Rightarrow \frac{a(1+q)(1+q)}{aq(1+q)} = \frac{1}{1} = \frac{1}{q}$$

$$\Rightarrow \frac{1+q}{q} = \frac{1}{q} \Rightarrow 1+q = 1 \Rightarrow q = 0$$

$$\Rightarrow 1+q = 1 \Rightarrow q = 0 \Rightarrow 1 + \frac{1}{q} = \frac{1}{q} \Rightarrow \frac{1+q}{q} = \frac{1}{q}$$

$$\Rightarrow q = 1, \frac{1}{q}$$

$$a_1 + a_1 q = 1 \Rightarrow a_1(1+q) = 1 \Rightarrow a_1 = \frac{1}{1+q}$$

$$1, 1, 1, 1$$

$$1, 1, 1, 1 \quad \text{بزرگترین است} \quad q = \frac{1}{q}$$

$$aq^{-1} + a + aq = 1 \Rightarrow \frac{1}{q} + 1 + q = 1$$

$$\Rightarrow \frac{1}{q} + 1 + q = 1 \Rightarrow \frac{1}{q} + q = 0 \Rightarrow q^2 + 1 = 0$$

$$aq^{-1} + a + aq = 1 \Rightarrow a^2 = 1 \Rightarrow a = 1$$

$$aq^{-1} + a + aq = 1 \Rightarrow q^2 - 1 + q = 0 \Rightarrow (q-1)(q+1) = 0$$

$$\frac{1}{q}, 1, q \rightarrow \frac{1}{q}, 1, q \quad q = 1, \frac{1}{q}$$

Subject .

Year.

Month.

Day.

الف) 2, 4, 18, ...

$$S_{1,2} = r \left(\frac{r^n - 1}{r - 1} \right) = \frac{r^n - 1}{r - 1}$$

$$\Rightarrow r^1 \times r^0 + r^2 \times r^{-1} + \dots + r^n \times r^{n-1} = \frac{r^n - 1}{r - 1}$$

$$a_1 q \times a_1 q^2 \times \dots \times a_1 q^{n-1} = \frac{a_1^n \times q^{n(n-1)/2}}{1}$$

$a, aq, aq^2, aq^3, \dots$

$$\Rightarrow aq - a, aq^2 - aq, aq^3 - aq^2, \dots$$

$$\Rightarrow a(q-1), aq(q-1), aq^2(q-1), \dots$$

↓
جواب: n ضرب q (مقدار) $(q-1)$

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

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

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

↓
نکته: فرمول حساب اعداد n

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

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

$$\Rightarrow qS_n = aq + aq^2 + \dots + aq^n$$

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

$$\Rightarrow S_n - qS_n = a - aq^n \Rightarrow S_n(1-q) = a(1-q^n) \Rightarrow S_n = \frac{a(1-q^n)}{(1-q)}$$