

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

$q=2$

$$a_{10} = a_1 q^9$$

$$a_{\varepsilon} = a_1 q^r \rightarrow \sqrt{a_{10}} = a_1 q^r = \frac{1}{r} \times 2^r = 32$$

$$a_n = (2)^{n-2} = 128 \rightarrow n = 9$$

(الف) $a_{10} = a_1 q^9 = \frac{1}{2} \times 2^9 = 256$
(ب) $\frac{a_{10}}{a_{13}} = q^3 = 2^3 = 8$
(ج) $a_{10} = a_1 q^9$
(د) $a_{\varepsilon} = a_1 q^r \rightarrow \sqrt{a_{10}} = a_1 q^r = \frac{1}{r} \times 2^r = 32$

$$\frac{a_n}{a_{\varepsilon}} = q^r = \frac{99}{12} = 8 \rightarrow q = 2$$

$$a_{10} = a_1 \times q^9 = a_n \times q^r = 99 \times 8 = 792$$

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

$\underbrace{a_2 \times a_3 \times a_4}_{a_3^3}$

$$\Rightarrow a_3^3 = 243 \rightarrow a_3 = 3$$

$$a_1 \times a_5 = a_3^2 = 3^2 = 9$$

$$2^a, \varepsilon\sqrt{2}, 2^b$$

$$(\varepsilon\sqrt{2})^r = 2^{a+b} \rightarrow 32 = 2^{a+b} \Rightarrow a+b = 5$$

$$\text{میانگین} = \frac{a+b}{2} = \frac{5}{2} = 2.5$$

$$1-x, x, x+1$$

$$a_r, a_v, a_{11}$$

$$a_r a_{11} = a_v^2 \Rightarrow 1-x^r = x^r \rightarrow x^r = \frac{1}{2} \rightarrow x = \frac{\pm\sqrt{2}}{2}$$

$$\cancel{a \left(\frac{q^n - 1}{q - 1} \right) = 21 + 12 = 33} \quad \frac{a(1+q^3)}{a(1+q)} = \frac{51}{12} = \frac{17}{4}$$

$$3q^2 - 3q - 3 = 3q^2 - 10q + 12 = 0 \rightarrow q = \frac{10 \pm \sqrt{100 - 48}}{6} = \frac{10 \pm \sqrt{52}}{6}$$

$$\Rightarrow q = 3, q = \frac{1}{3} \rightarrow a_n = 21 - q - 3 - 1$$

$$\rightarrow a_n = 1 - 3 - q - 21 \quad (21)$$

$$a, a_r, a_{3r} = 21 \rightarrow a_r = 21 \rightarrow a_r = 3$$

$$a_1 + a_r + a_{3r} = 13 \rightarrow \frac{3}{q} + 3 + 3q = 13 \rightarrow \frac{3q^2 + 3q + 3}{q} = 13$$

$$\rightarrow 13q = 3q^2 + 3q + 3 \rightarrow 3q^2 - 10q + 3 = 0 \rightarrow a^2 - 10q + 9 = 0$$

$$\left[\begin{array}{l} q = 3 \rightarrow a_n = 1, 3, 9 \\ a = \frac{1}{3} \rightarrow a_n = 9, 3, 1 \end{array} \right] \rightarrow (q-1)(q-9) = 0$$

$$\rightarrow q = \frac{1}{3}, q = 3$$

$$S_{10} = a_1 \frac{q^n - 1}{q - 1} = \cancel{3} \frac{3^{10} - 1}{\cancel{3} - 1} = 3^{10} - 1 \quad (\text{الن})$$

$$P_{10} = \sqrt{(a_1 a_{10})^{10}} = (a_1 a_{10})^5 \rightarrow (2 \times 2 \times 3^9)^5 = 2^{10} \times 3^{45}$$

$$a_n = \frac{a}{q}, a, aq, \dots$$

$$a - \frac{a}{q}, aq - a, aq^2 - aq, aq^3 - aq^2$$

$$\frac{a}{q} (q-1), a(q-1), aq(q-1), aq^2(q-1)$$

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

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

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

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

$$S_n q = aq + aq^2 + \dots + aq^n \rightarrow S_n - S_n q = a - aq^n = a(1 - q^n)$$

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