

$$\alpha_1 + \alpha_2 = 21, \quad \alpha_2 + \alpha_3 = 12 \quad (6)$$

$$\frac{\alpha_1(1+q^2)}{q\alpha_1(1+q)} = \frac{1+q^2}{q(1+q)} \rightarrow \frac{(1+q)(1-q+q^2)}{q(1+q)} = \frac{1-q+q^2}{q} = \frac{1}{q}$$

$$3(1-q+q^2) = 12 \Rightarrow 3q^2 - 10q + 3 = 0$$

$$\Delta = 100 - 36 = 64 \rightarrow \frac{10 \pm \sqrt{64}}{6} = \begin{cases} 3 \\ \frac{1}{3} \end{cases}$$

$$\alpha_1(1+q^2) = 21$$

$$q=3 \rightarrow (\alpha_1 + 3\alpha_2) = \alpha_1(1+3) = 21 \rightarrow \boxed{\alpha_1 = 1}$$

$$1, 3, 9, (27) \rightarrow \text{جواب}$$

$$\alpha_1 + \alpha_2 + \alpha_3 = \alpha_1(1+q+q^2) = 13 \quad (7)$$

$$\alpha_1 \cdot \alpha_2 \cdot \alpha_3 = \alpha_1^3 \cdot q^3 = 27 \Rightarrow \alpha_1 q = 3$$

$$\alpha_1 + \alpha_1 q + \alpha_1 q^2 = 13$$

(8)

$$\alpha_1(1+q^2) = 10 \rightarrow \alpha_1 + \frac{q\alpha_1}{\alpha_1} = \frac{\alpha_1^2 + q}{\alpha_1} = 10$$

$$\alpha_1^2 - 10\alpha_1 + q = 0$$

$$\alpha_1 = \begin{cases} 1 \\ +9 \end{cases}$$

$$q = \begin{cases} 3 \\ \frac{1}{9} \end{cases}$$

$$\alpha_n = 1, 3, 9, 9, 3, 1$$

$$2, 5, 11, \dots \quad \alpha_n = 2(3)^{n-1}$$

$$S_{10} = \alpha_1 \left(\frac{q^{10} - 1}{q - 1} \right) = 2 \left(\frac{3^{10} - 1}{3 - 1} \right) = 3^{10} - 1 \quad (\text{الف})$$

$$P_n = \sqrt{(\alpha_1 \cdot \alpha_n)^n} \rightarrow \sqrt{(2 \times 2 \times 3^9)^6} = (2^2 \times 3^9)^6$$

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$$\alpha_n = \frac{1}{r} (r)^{n-1} \quad (1)$$

$$\alpha_{10} = \frac{1}{r} (r)^9 = 256 \quad (\text{الف})$$

$$\frac{\alpha_1 q^6}{\alpha_1 q^{12}} = q^6 = r^6 = 16 \quad (\text{ب})$$

$$b^r = \alpha c \rightarrow \begin{cases} \alpha = r^r \\ c = r^1 \end{cases} \Rightarrow r^{10} = b^r \quad (\text{ج})$$

$$b = r^6 = 32$$

وقت دے؟

$$\frac{\alpha_1}{\alpha_0} = \frac{\alpha q^r}{\alpha q^r} = q^r = \frac{96}{12} = 8 \rightarrow q = 2 \quad (2)$$

$$\alpha_0 = \alpha_1 q^r = \alpha_1 \times 2^6 = 12 \rightarrow \alpha_1 = \frac{3}{4}$$

$$\alpha_n = \frac{3}{4} (2)^{n-1}$$

$$\alpha_{10} = \frac{3}{4} (2)^9 = 384$$

$$\alpha_1 \times \alpha_2 \times \alpha_3 \times \alpha_4 \times \alpha_5 = 305$$

$$\alpha_n = 3, 3, 3, \dots \quad q = 1$$

(الف) 3

$$3^2 = 9 \quad (\text{ب})$$

$$r^a, r^b, r^c$$

$$b^r = \alpha c \rightarrow r^a \cdot r^b = 32 \rightarrow r^{a+b} = 2^5 \quad (4)$$

$$a+b=5$$

$$b = \frac{a+c}{r} = \frac{a+b}{r} = \frac{5}{r} = 2/5$$

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

$$(11111) \quad (5)$$

$$b^r = \alpha c \rightarrow x^2 = x - x^2 + 1 - x = 1 - x^2 = 1$$

$$\frac{\sqrt{2}}{2}$$

$$x = \pm \sqrt{\frac{1}{2}}$$

$$\alpha, \alpha q, \alpha q^2, \dots$$

(9)

$$\text{سلسلة جبرية} = \underbrace{\alpha q - \alpha}_{\alpha(q-1)}, \underbrace{\alpha q^2 - \alpha q}_{\alpha q(q-1)}, \underbrace{\alpha q^3 - \alpha q^2}_{\alpha q^2(q-1)}, \dots$$

$$\rightarrow \alpha_n = \alpha_1 (q)^{n-1} \Rightarrow \alpha(q-1) \times q^{n-1}$$

(5)

قدر نسب = q

$$S_n = \frac{n}{r} (ra + (n-1)d) = \frac{n}{r} (\alpha_1 + \alpha_n)$$

(5)

(10)

(الف)

$$S_n = \alpha_1 + \alpha_2 + \alpha_3 + \dots + \alpha_n \Rightarrow S_n = \alpha_1 + (\alpha_1 + d) + (\alpha_1 + 2d) + (\alpha_1 + 3d) + \dots + \alpha_n$$

$$S_n = \alpha_n + \alpha_{n-1} + \alpha_{n-2} + \dots + \alpha_1 \Rightarrow S_n = \alpha_n + (\alpha_n - d) + \dots + \alpha_1 \leftarrow \text{حالا از آخر بابت}$$

جمع

$$2S_n = \underbrace{(\alpha_1 + \alpha_n) + (\alpha_1 + \alpha_n) + \dots + (\alpha_1 + \alpha_n)}_{n} \Rightarrow 2S_n = n(\alpha_1 + \alpha_n)$$

$$S_n = \frac{n}{2} (\alpha_1 + \alpha_n)$$

$$S_n = \alpha_1 \left(\frac{1-q^n}{1-q} \right)$$

(5)

(ب)

$$S_n = \alpha_1 + \alpha_1 q + \alpha_1 q^2 + \dots + \alpha_1 q^{n-1} \quad \times q \rightarrow qS_n = \alpha_1 q + \alpha_1 q^2 + \dots + \alpha_1 q^n$$

مترس

$$S_n - qS_n = \alpha_1 - \alpha_1 q^n$$

$$S_n(1-q) = \alpha_1(1-q^n)$$

$$S_n = \alpha_1 \frac{(1-q^n)}{(1-q)}$$