

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

$$\text{الف) } a_n = 2^{n-2} \rightarrow a_{10} = 2^{10-2} = 2^8 = 256$$

$$\text{ج) } a_7 = 2^{7-2} = 2^5 = 32$$

$$\text{ب) } \frac{a_{14}}{a_{13}} = \frac{2^{14-2}}{2^{13-2}} = 2^1 = 2^2 = 4$$

$$\text{د) } 2^{n-2} = 128 \rightarrow 2^{n-2} = 2^7 \rightarrow n-2=7 \rightarrow n=9$$

1

$$\star \frac{a_1}{a_5} = \frac{2^1}{2^5} = 2^{-4} = \frac{1}{16} \rightarrow a_1 = 2 \rightarrow a_5 = a_1 \cdot 2^4 = 2 \times 16 = 32$$

2

$$\text{الف) } a_1 \times a_2 \times a_3 \times a_4 \times a_5 = 2^4 \times 3 \rightarrow \frac{2^1}{2^2} \times \frac{2^2}{2^3} \times \frac{2^3}{2^4} \times \frac{2^4}{2^5} \times \frac{2^5}{2^6} = 2^1 \times 3 = 2^2 \times 3 = 12 \rightarrow a_6 = 12$$

$$\text{ب) } a_1 \times a_5 = \frac{2^1}{2^2} \times \frac{2^5}{2^6} = 2^{-1} = 2^2 = 4$$

3

$$2^a, 4\sqrt{2}, 2^b \rightarrow (4\sqrt{2})^2 = 2^a \times 2^b \rightarrow 32 = 2^{a+b} \rightarrow 2^5 = 2^{a+b} \rightarrow a+b=5$$

واسطه حسابی
بین a و b

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

4

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

(3) (7) (11)

5

$$a_1 + a_5 = 28 \rightarrow a_1 + a_1 \cdot 2^4 = 28$$

$$a_2 + a_6 = 12 \rightarrow a_1 \cdot 2 + a_1 \cdot 2^5 = 12 \rightarrow a_1 \cdot 2(1 + 2^4) = 12 \rightarrow a_1(1 + 2^4) = \frac{12}{2}$$

$$a_1 \left(\frac{2^5 - 1}{2 - 1} \right) = f_0 \rightarrow a_1 \left(\frac{(2^5 + 1)(2 - 1)(2 + 1)}{2 - 1} \right) = a_1(2^5 + 1)(2 + 1) = f_0 \rightarrow \frac{12}{2}(2^5 + 1) = f_0$$

$$\Rightarrow 12 \cdot \frac{2^5 + 1}{2} = f_0 \rightarrow 12 \cdot \frac{33}{2} = f_0 \rightarrow 198 = f_0$$

با استفاده از ماشین حساب

6

$$\Delta = 100 - 36 = 64 \rightarrow \frac{10 \pm 8}{6} = 3 \text{ or } \frac{1}{3} \rightarrow q = \frac{1}{3} \rightarrow a_1 = 27$$

$$a_1 + a_r + a_p = 11 \rightarrow a_1 + a_r + a_p = 11 \rightarrow a_1 + a_r + a_p = 11$$

$$q = 3 \rightarrow 3a_1 \times 3 = 12 \rightarrow a_1 = 1 \rightarrow a_f = 1 \times 3^3 = 27 \rightarrow a_f = 27$$

بزرگترین جمله

$$a_1 + a_r + a_p = 11$$

$$a_1 \times a_r \times a_p = 27 \rightarrow \frac{a_r}{q} \times a_r \times a_r q = a_r^3 = 27 \rightarrow a_r = 3$$

$$a_1 q = 3 \rightarrow a_1 = \frac{3}{q}$$

$$\frac{3}{q} + 3q = 10 \rightarrow 3q^2 + 3 = 10q \rightarrow 3q^2 - 10q + 3 = 0 \rightarrow \Delta = 100 - 36 = 64 \rightarrow \frac{10 \pm 8}{6} = 3 \text{ or } \frac{1}{3}$$

$$a = 3 \rightarrow 1, 3, 9$$

$$q = \frac{1}{3} \rightarrow 9, 3, 1$$

$$q = 3 \rightarrow \frac{a_r}{3} = 1 \rightarrow a_1 = 1$$

$$q = \frac{1}{3} \rightarrow 3a_r = 9 \rightarrow a_1 = 9$$

$$a_n = 2, 5, 11, \dots$$

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

$$ب) P_{10} = (2 \times 2 \times 3^9)^{\Delta} = 2^{\Delta} \times 3^{9\Delta} = 1024 \times 3^{9\Delta}$$

$$a_1, a, aq, aq^2, aq^3, \dots$$

$$a_1 q - a_1, a_1 q^2 - a_1 q, a_1 q^3 - a_1 q^2, \dots$$

$$a_1(q-1), a_1 q(q-1), a_1 q^2(q-1), \dots$$

نشان دهید

$$\frac{a_1 q(q-1)}{a_1(q-1)} = \frac{a_1 q^2(q-1)}{a_1 q(q-1)} = q$$

$$الف) a_1 + (a_1 + d) + (a_1 + 2d) + \dots + (a_1 + (n-1)d) = na_1 + \frac{n(n-1)d}{2} = \frac{n}{2} (2a_1 + (n-1)d)$$

$$ب) S_n = a_1 + a_1 q + a_1 q^2 + \dots + a_1 q^{n-1}$$

$$qS_n = a_1 q + a_1 q^2 + a_1 q^3 + \dots + a_1 q^n$$

$$qS_n - S_n = a_1 q^n - a_1 \rightarrow S_n(q-1) = a_1(q^n - 1) \rightarrow S_n = a_1 \left(\frac{q^n - 1}{q - 1} \right)$$