

۱۹۱۷۵

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

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

ب) $\frac{a_{14}}{a_{13}} = \frac{a_{13} q^r}{a_{13}} = q^r = 2^r = 14$

ج) $a_5 = 2^{5-2} = 2^3 = 8$

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

$$\frac{a_1}{a_8} = \frac{a_8 q^r}{a_8} = q^r = \frac{94}{14} = 8 \rightarrow q=2 \rightarrow a_{10} = a_1 q^r = 44 \times 2^8 = 11456$$

الف) $a_1 \times a_2 \times a_3 \times a_4 \times a_5 = 2^4 \times 2^5 \rightarrow \frac{a_5}{q^r} \times \frac{a_4}{q} \times a_3 \times a_2 q \times a_1 q^r = a_5^5 = 2^9 \rightarrow a_5 = 2$

ب) $a_1 \times a_5 = \frac{a_5}{q^r} \times a_5 q^r = a_5^2 = 2^2 = 4$

$2^a, \sqrt[4]{2}, 2^b \rightarrow (\sqrt[4]{2})^r = 2^a \times 2^b \rightarrow 2^{\frac{r}{4}} = 2^{a+b} \rightarrow 2^{\frac{r}{4}} = 2^{a+b} \rightarrow a+b=5$

واسطه حسابی $\Rightarrow \frac{a+b}{2} = \frac{5}{2} = 2.5$
بین a, b

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

$a_1 + a_4 = 18 \rightarrow a_1 + a_1 q^3 = 18$

$a_2 + a_5 = 14 \rightarrow a_1 q + a_1 q^4 = 14 \rightarrow a_1 q(q+1) = 14 \rightarrow a_1(q+1) = \frac{14}{q}$

$a_1 \left(\frac{q^4-1}{q-1} \right) = 18 \rightarrow a_1 \left(\frac{(q^2+1)(q-1)(q+1)}{q-1} \right) = a_1(q^2+1)(q+1) = 18 \rightarrow \frac{14}{q}(q^2+1) = 18$

$\Rightarrow 14q + \frac{14}{q} = 18 \Rightarrow 14q^2 + 14 = 18q \rightarrow 14q^2 - 18q + 14 = 0 \Rightarrow 7q^2 - 9q + 7 = 0 \Rightarrow$

$\Delta = 100 - 196 = -96 \rightarrow \frac{10 \pm 4i}{4} = \frac{5 \pm 2i}{2} \rightarrow q = \frac{1}{p} \Rightarrow a_1 = 27$ بزرگترین جمله

$\frac{a_1}{p^3} \left(\frac{p^4}{p^3} \right) = 18 \rightarrow a_1 = 27$

$q = \frac{1}{p} \rightarrow a_1 \times p^3 = 18 \rightarrow a_1 = 1 \rightarrow a_4 = 1 \times p^3 = 27$

$\Rightarrow a_4 = 27$ بزرگترین جمله

$a_1 + a_2 + a_3 = 13$

$a_1 + a_3 = 10 \rightarrow a_1 + a_1 q^2 = 10 \rightarrow \frac{p}{q} + \frac{p}{q} \times q^2 = \frac{p}{q} + p = 10$

$a_1 \times a_2 \times a_3 = 27 \rightarrow \frac{a_2}{q} \times a_1 \times a_1 q = a_1^3 = 27 \Rightarrow a_1 = 3$

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

$\frac{p}{q} + p = 10 \rightarrow 3q^2 + 3 = 10q \rightarrow 3q^2 - 10q + 3 = 0$

$\Delta = 100 - 36 = 64 \Rightarrow \frac{10 \pm 8}{4} = \frac{18}{4} = \frac{9}{2} \rightarrow q = \frac{2}{3} \Rightarrow \frac{a_2}{p} = 1 \rightarrow a_1 = 1$

$q = \frac{2}{3} \rightarrow 1, \frac{2}{3}, \frac{4}{9}$

$q = \frac{3}{2} \rightarrow 3, \frac{9}{2}, 13.5$



$q = \frac{1}{2} \Rightarrow 3, 1.5, 0.75 \rightarrow a_1 = 9$

$$a_n = 2, 4, 18, \dots$$

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

$$\text{ب) } P_{10} = (2, 4, 18)^{10} = 1024 \times 18^{10} = 1024 \times 18^{10}$$

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

$$a, q - a_1, a, q^2 - a, q, a, q^3 - a, q^2$$

$$a_1(q-1), a_1 q(q-1), a_1 q^2(q-1) \quad \text{دنباله هندسی}$$

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

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

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

$$qS_n = a, q + a, q^2 + a, q^3 + \dots + a, q^n$$

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