

سوره ی نعلین: ۱۴

دختران دجوم کرده

زعداد دهقانی

$$a_n = \frac{1}{r}, 1, 2, \dots \quad a_n = aq^{n-1} \quad (الف)$$

$$a_n = \frac{1}{r} \times r^{n-1}$$

$$a_{10} = \frac{1}{r} \times r^9 = 254$$

$$\frac{a_{10}}{a_1} = \frac{aq^{14}}{aq^1} = \frac{q^{14}}{q^1} = q^t = r^t = 14 \quad (ب)$$

$$a_8 = \frac{1}{r} \times r^8 = 8 \quad P_n = \sqrt{(a_1 \times a_n)^n} \quad (ج)$$

$$a_{10} = 254 \quad \rightarrow \sqrt{a_8 \times a_{10}} = \sqrt{8 \times 254}$$

$$= \sqrt{1632} = 40$$

$$a_n = \frac{1}{r} \times r^{n-1} = 121 \rightarrow r^{-1} \times r^{n-1} = r^9 \quad (د)$$

$$r^n \times r^{-1} = r^9$$

$$r^n = r^9 \times r^1$$

$$r^n = r^9 \rightarrow n = 9$$

$$a_8 = aq^8 = 12 \quad \frac{a_n}{a_8} = \frac{aq^9}{aq^8} = q^1 = \frac{94}{12} \rightarrow q^1 = 1 \quad r$$

$$a_1 = aq^0 = 94 \quad q = 2$$

$$a_8 = aq^8 = a \times (2)^8 \Rightarrow \frac{12a}{12} = \frac{12}{12} \rightarrow a = \frac{3}{8}$$

$$a_{10} = aq^9 \rightarrow \frac{3}{8} \times (2)^9 \Rightarrow a_{10} = 312$$

MRNOTE

$$a_1 \times a_2 \times a_3 \times a_4 \times a_5 = r \epsilon^3$$

$$a_1 \times (a, q)(a, q^2)(a, q^3)(a, q^4) = r \epsilon^3 \quad (1) \quad 3$$

$$a_1^{\omega} \times q^{10} = r \epsilon^3$$

$$a_1^{\omega} = a q^4 \Rightarrow (a_1^{\omega} q^{10})^{\frac{1}{\omega}} = (r \epsilon^3)^{\frac{1}{\omega}} = \sqrt[r \epsilon^3]{\omega} \Rightarrow a_1^{\omega} = \omega$$

$$a_1 \times a_2 = ?$$

$$a_1 \times a_2 = a_1^r \times q^t$$

$$(a, q^4)^r = a_1^r = r^r = 9$$

$$a_1 \times a_2 = \boxed{9} \quad \leftarrow$$

$$b^r = ac$$

$$(\epsilon \sqrt{r})^r = r^b \times r^a$$

$$b = \frac{a+c}{r}$$

$$r^r = r^{b+a}$$

$$\boxed{\frac{a}{r} = \frac{b+a}{r}} \rightarrow a+b = \omega$$

$$\boxed{\frac{b+a}{r} = \frac{\omega}{r}}$$

$$a_{\omega} = 1 - \pi$$

$$b^r = ac$$

$$a_{\omega} = \pi$$

$$\pi^r = (1 - \pi)(1 + \pi)$$

$$a_{\pi} = \pi + 1$$

$$\pi^r = 1 - \pi^r \rightarrow \pi^r = 1 - \pi^r$$

$$r \pi^r = 1 \rightarrow \pi^r = \frac{1}{r} \rightarrow \pi = \sqrt[r]{\frac{1}{r}} \rightarrow \pi = \sqrt[r]{\frac{1}{r}}$$

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$$a_1 + a_2 = 11 \rightarrow a_1 + aq^2 = 11$$

$$a_2 + a_3 = 11 \rightarrow aq + aq^2 = 11 \rightarrow aq(1+q) = 11$$

$$\hookrightarrow a = \frac{11}{q(1+q)}$$

$$\frac{11}{q(1+q)} (1+q^3) = 11$$

$$1+q^3 = (1+q)(1-q+q^2)$$

$$\frac{11(1+q)(1-q+q^2)}{q(1+q)} = 11$$

$$\frac{11(1-q+q^2)}{q} = 11 \quad 11(1-q+q^2) = 11q$$

$$11q^2 - 10q + 11 = 0 \rightarrow 11q^2 - 10q + 11 = 0$$

$$q = 3 \Rightarrow a = \frac{11}{3(1+3)} = \frac{11}{12} = 1$$

$$q = 3 \quad q = \frac{1}{3}$$

$$\hookrightarrow 1, 3, 9, \textcircled{27}$$

بزرگترین

$$q = \frac{1}{3} \Rightarrow a = \frac{11}{\frac{1}{3}(1+\frac{1}{3})} = \frac{11}{\frac{4}{9}} = \frac{99}{4}$$

$$\hookrightarrow \textcircled{\frac{99}{4}}, 9, 3, 1$$

$$\text{بزرگترین} = \textcircled{\frac{99}{4}}$$

بزرگترین

Elipon

$$a + ar + ar^2 = 12$$

$$a \times ar \times ar^2 = 12 \rightarrow (ar)^3 = 12 \rightarrow ar = \sqrt[3]{12}$$

$$a = \frac{\sqrt[3]{12}}{r}$$

$$\frac{\sqrt[3]{12}}{r} + \frac{\sqrt[3]{12}r}{r} + \frac{\sqrt[3]{12}r^2}{r} = 12$$

$$\frac{\sqrt[3]{12} + \sqrt[3]{12}r + \sqrt[3]{12}r^2}{r} = 12 \rightarrow 12r = \sqrt[3]{12} + \sqrt[3]{12}r + \sqrt[3]{12}r^2$$

$$\sqrt[3]{12}r^2 - 10r + \sqrt[3]{12} = 0$$

$$r^2 - 10r + 9 = 0$$

$$(r - \frac{9}{\sqrt[3]{12}})(r - \frac{1}{\sqrt[3]{12}})$$

$$r = \sqrt[3]{12}$$

$$r = \frac{1}{\sqrt[3]{12}}$$

$$ar = \sqrt[3]{12} \rightarrow a = \frac{\sqrt[3]{12}}{r} \xrightarrow{r = \sqrt[3]{12}} r = \sqrt[3]{12} \rightarrow a = \frac{\sqrt[3]{12}}{\sqrt[3]{12}} = 1$$

$$(1, \sqrt[3]{12}, 9)$$

$$\xrightarrow{r = \frac{1}{\sqrt[3]{12}}} r = \frac{1}{\sqrt[3]{12}} \rightarrow a = \frac{\sqrt[3]{12}}{\frac{1}{\sqrt[3]{12}}} = 9$$

$$(9, \sqrt[3]{12}, 1)$$

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$$a_n = \underbrace{2}_{\times 2}, \underbrace{4}_{\times 2}, \underbrace{11}_{\times 2}, \dots \quad q = 2 \quad (\text{الف})$$

$$S_{10} = a \left(\frac{1 - q^n}{1 - q} \right) \rightarrow 2 \left(\frac{1 - 2^{10}}{1 - 2} \right) \rightarrow 2 \left(\frac{2^{10} - 1}{2 - 1} \right)$$

$$\rightarrow \cancel{2} \left(\frac{2^{10} - 1}{\cancel{2}} \right) \rightarrow 2^{10} - 1 = \boxed{1023}$$

$$P_n = (a, \times a, \times \dots \times a_n) = a^n \times q^{\frac{n(n-1)}{2}} \quad (-)$$

$$P_{10} = 2^{10} \times 2^{\frac{10 \times 9}{2}} = 2^{10} \times 2^45$$

$$\Rightarrow \boxed{P_{10} = 1023 \times 2^45}$$

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

$$(aq - a), (aq^2 - aq), (aq^3 - aq^2), \dots$$

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

$$\frac{\text{جمله دوم}}{\text{جمله اول}} = \frac{aq}{a} = \frac{aq(aq - 1)}{a(q - 1)} = q \quad \boxed{q - 1}$$

$$\boxed{q = 1}$$

$$S_n = \frac{n}{2} (2a + (n-1)d) \quad \text{الف (1)}$$

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

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

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

$$rS_n = [ra+(n-1)d] + [ra+(n-2)d] + \dots + [ra+(n-1)d]$$

$$\frac{rS_n}{r} = \frac{n[ra+(n-1)d]}{r} \rightarrow S_n = \frac{n}{r} [ra+(n-1)d]$$

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

ب (2)

$$a, ar, ar^2, \dots, ar^n$$

$$rS_n = ar + ar^2 + ar^3 + \dots + ar^n$$

$$S_n - rS_n = a - ar^n$$

$$S_n(1-r) = a(1-r^n) \xrightarrow{r \neq 1} S_n = a \left(\frac{r^n - 1}{r - 1} \right)$$