

نام و نام خانوادگی: علی پوری بدین تبار ۱۴۰۱ ۱۹, ۷۵ کلاس: دهم سیر:

۱- الف $a_1 = \frac{1}{2}$ $a_2 = 1$ $q = \frac{a_2}{a_1} = \frac{1}{\frac{1}{2}} = 2$ قدر نسبت $a_n = a_1 \times q^{n-1}$

$a_{10} = \frac{1}{2} \times 2^{10-1} = \frac{1}{2} \times 2^9 = \frac{512}{2} = 256$ ✓ (۲)

$\frac{a_{14}}{a_{12}} = \frac{a_1 \times q^{14}}{a_1 \times q^{12}} = q^{14-12} = q^2 = 2^2 = 4$ ✓ (۱۵)

$a_6 = \frac{1}{2} \times 2^5 = 16$ ✓ (۳۲)

$a_{10} = 256$ $\sqrt{a_6 \times a_{10}} = \sqrt{16 \times 256} = \sqrt{4096} = 64$ (۲)

$a_n = 128$ $2^{n-1} = 128$ $n-1 = 7$ $n = 8$ ✓ (۹)

$a_n = a_1 \times q^{n-1}$ $a_8 = a_1 \times q^{8-1} = a_1 \times q^7 = 128$ (۲) - ۲

$\frac{a_8}{a_6} = \frac{a_1 \times q^7}{a_1 \times q^5} \rightarrow \frac{128}{16} = q^{7-5} = q^2$ $8 = q^3$ $q = 2$

$a_1 \times q^7 = 128$ $a_1 \times 2^7 = 128$ $a_1 = \frac{128}{128} = 1$

$a_{10} = a_1 \times q^9 = 1 \times 2^9 = 512$ $a_{10} = 512$ ✓ (۲۸۴)

$a_1 \times (a_1 \times q) \times (a_1 \times q^2) \times (a_1 \times q^3) \times (a_1 \times q^4) = 243$ (۲) - ۳

$a_1^5 \times q^{10} = 243$ $a_1 \times q^2 = 3$ $a_3 = a_1 \times q^2 = 3$ ✓ (۲)

$a_1 \times a_5 = a_1 \times (a_1 \times q^4) = a_1^2 \times q^4$ $a_1 \times a_5 = (a_1 \times q^2)^2 = 3^2 = 9$ $a_1 \times a_5 = 9$ ✓ (۹)

$(\sqrt[4]{2})^2 = 2^{\frac{1}{2}} \times 2^{\frac{1}{2}} = \sqrt{2} = 2^{\frac{1}{2}} \times 2^{\frac{1}{2}} = 2^{\frac{1}{2} + \frac{1}{2}} = 2^1 = 2$ (۲) - ۴

$(\sqrt[4]{2})^2 = (2^{\frac{1}{4}})^2 = 2^{\frac{2}{4}} = 2^{\frac{1}{2}} = \sqrt{2}$ $2^{\frac{1}{2}} \times 2^{\frac{1}{2}} = 2^{\frac{1}{2} + \frac{1}{2}} = 2^1 = 2$ $a+b=2$

$\frac{a+b}{2} = \frac{2}{2} = 1$ ✓ (۲, ۵)

$a_2 = 1-x$ $a_3 = x$ $a_{11} = x+1$ $a_{11}^2 = q \times a_{11}$ (۱, ۷۵) - ۵

$x^2 = (1-x) \times (x+1)$ $\Rightarrow x^2 = x+1-x^2-x$

$2x^2 = 1$ $x^2 = \frac{1}{2}$ $x = \pm \frac{1}{\sqrt{2}} = \pm \frac{\sqrt{2}}{2}$ $\frac{\sqrt{2}}{2}$ ✓ (۲)

$a_n = a_1 \times q^{n-1}$ $a_1(1+q^3) = 21$ $a_2 + a_3 = 12$ $a_1 \times q(1+q) = 12$ (۲)

$\frac{a_1(1+q^3)}{a_1 \times q(1+q)} = \frac{21}{12} = \frac{7}{4}$ $\frac{1-q+q^3}{q} = \frac{7}{4}$ $4(1-q+q^3) = 7q$

$q_1 = \frac{1}{2} = 2$ $a_6 = 1 \times 2^5 = 32$ ✓ (۲۷)

$q_2 = \frac{1}{2} = \frac{1}{2}$ $a_1 + a_6 = 1 + 32 = 33$ $a_2 + a_5 = 2 + 16 = 18$

$$a_n = a_1 \times q^{n-1} \quad a_1 \times a_2 \times a_3 = 27 \quad a_1^3 \times q^3 = 27$$

$$a_2 = 3 \quad a_2 = a_1 \times q \Rightarrow 3 = \frac{a_1}{2} \Rightarrow a_1 = 6 \quad a_1 = 9 \quad q = \frac{3}{9} = \frac{1}{3}$$

$$a_1 = 1 \quad q = \frac{3}{1} = 3 \quad a_1 + \frac{q}{a_1} = 10 \quad a_1^2 + q = 10 \quad a_1 = 9 \quad q = \frac{1}{9}$$

$$a_1 = 1 \quad a_2 = 1 \times 3 = 3 \quad a_3 = 1 \times 9 = 9 \quad (1, 3, 9) \checkmark$$

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

$$q = \frac{a_2}{a_1} = \frac{3}{1} = 3 \quad \frac{a_3}{a_2} = \frac{9}{3} = 3 \quad s_n = a_1 \times \frac{q^n - 1}{q - 1} \quad q \neq 1$$

$$s_{10} = 1 \times \frac{3^{10} - 1}{3 - 1} = \frac{3^{10} - 1}{2} = 59049 \quad (2)$$

$$P_n = (a_1)^n \times q^{\frac{n(n-1)}{2}} \quad P_{10} = 9^{10} \times \frac{10 \times 9}{2}$$

$$P_{10} = 9^{10} \times 45 = 1024 \times 9^{10} \quad (3)$$

$$a_n = a_1 \times q^{n-1}$$

$$b_1 = a_2 - a_1 = a_1 q - a_1 = a_1 (q - 1)$$

$$b_2 = a_3 - a_2 = a_1 q^2 - a_1 q = a_1 q (q - 1)$$

$$b_3 = a_4 - a_3 = a_1 q^3 - a_1 q^2 = a_1 q^2 (q - 1)$$

$$b_n = a_1 q^{n-1} (q - 1)$$

$$\frac{b_{n+1}}{b_n} = \frac{a_1 q^n (q - 1)}{a_1 q^{n-1} (q - 1)} = \frac{b_{n+1}}{b_n} = q$$

$$\frac{b_{n+1}}{b_n} = q \quad b_1 = a_1 (q - 1)$$

$$s_n = \frac{n}{2} (2a + (n-1)d) \quad a, a+d, a+2d, \dots, a+(n-1)d$$

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

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

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

$$2s_n = n[2a + (n-1)d] \quad \frac{2s_n}{2} = \frac{n[2a + (n-1)d]}{2}$$

$$s_n = a \left[\frac{q^n - 1}{q - 1} \right] \quad \text{مردود را به تقسیم}$$

$$s_n = a + aq + aq^2 + aq^3 + \dots + aq^{n-1} \quad (1)$$

$$q s_n = aq + aq^2 + aq^3 + \dots + aq^n$$

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

$$-s_n (q - 1) = a(q^n - 1) \quad \text{تقسیم بر } (q - 1)$$

$$s_n (q - 1) = a(q^n - 1) \quad s_n = na \text{ اگر } q = 1 \text{ و } q \neq 1$$