

۱۸۱۵۵

« به نام خدا »

آترسیا آفاصلی

(۱۱۵)

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

$$r=2 \quad a_{10} = \frac{1}{2} \cdot (2)^9 = \frac{256}{2} = 128$$

$$\frac{a_{14}}{a_{13}} = \frac{r^{14-13}}{r^{13-13}} = r^1 = r = 2 = 128$$

ج؟

$$\frac{1}{r} \cdot (r)^{n-1} = 128 \Rightarrow r^{n-1} = 256 = 2^8 \Rightarrow 1 = n-1 \Rightarrow n=9$$

$$\frac{a_1}{a_4} = \frac{r^1}{r^4} = r^{-3} = \frac{96}{12} = 8 \Rightarrow r=2$$

$$a_n = \frac{r}{r} \cdot (r)^{n-1}$$

$$a_{10} = \frac{r}{r} \cdot (r)^9 = \frac{2}{2} \cdot 2^9 = 256$$

$$(p/q)^n = p_n \Rightarrow (a_p)^n = 2^8 \Rightarrow a_p = 2^4 = 16$$

$$a_1 \times a_8 = (a_p)^2 \Rightarrow a_1 \times a_8 = r^2 = 9$$

$$b^2 = ac \Rightarrow (r\sqrt{r})^2 = r^a \times r^b = r^d = r^r$$

$$\Rightarrow a+b=d \Rightarrow \frac{a+b}{r} = \frac{d}{r} \Rightarrow \frac{d}{r} = 2, 8$$

$$a_n = 1-x = ar^n$$

$$a_1 = ar^0 = x$$

$$a_{11} = ar^{10} = x+1$$

$$(1-x)(x+1) = x^2$$

$$x + 1 - x^2 - x = x^2$$

$$1 - x^2 = x^2$$

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

$$a_1 + a_r = 21 \Rightarrow a + ar^r = 21 \Rightarrow a(1+r^r) = 21 \quad (9)$$

$$a_r + a_{r^2} = 12 \Rightarrow ar + ar^2 = 12 \Rightarrow ar(1+r) = 12 \quad (10)$$

$$\frac{ar(1+r)}{a(1+r)(1+r^r-r)} = \frac{12}{21} = \frac{4}{7} \Rightarrow \frac{r}{1+r^r-r} = \frac{4}{7} \Rightarrow 7r = 4 + 4r^r - 4r \Rightarrow 3r = 4 + 4r^r$$

$$\Delta = 100 - 4(4)(4) = 24 \Rightarrow \frac{10 \pm 1}{4} = \frac{11}{4} \Rightarrow \frac{r-r^r}{a-1} = \frac{11}{4} \Rightarrow ar^r = 22$$

$$a_1 \cdot a_r \cdot a_{r^2} = 22 \Rightarrow (a_r)^r = 22 \Rightarrow a_r = \sqrt[r]{22} \quad (11)$$

$$(a_r)^r = a_1 \cdot a_{r^2} \Rightarrow \frac{22}{r} = a_1 \cdot a_{r^2} = 9 \Rightarrow r = \frac{22}{9} \Rightarrow a_1 = 1, a_{r^2} = 9$$

و چون $a_r = \sqrt[r]{22}$ و $9 = \frac{1}{r}$

$$S_n = a \left(\frac{r^n - 1}{r - 1} \right) \quad (12)$$

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$$S_{10} = 4 \left(\frac{r^{10} - 1}{r - 1} \right) = 490491 \quad (الف)$$

$$P_{10} = \sqrt{(a_1 \times a_{10})^{10}} = \sqrt{(1 \times 9)^{10}} = \sqrt{9^{10}} = 9^5 = 59049 \quad (ب)$$

$$P_n = \sqrt{(a_1 \cdot a_n)^n} \quad a_{10} = ar^9 = 2 \left(\frac{22}{9} \right)^9 = 59049$$

$$a_n = ar^{n-1} \quad q = r$$

$$ar^n - ar^{n-1} = b_n \Rightarrow ar^{n-1}(r-1) = b_n \Rightarrow b_{n+1} = ar^n(r-1)$$

$$\frac{b_{n+1}}{b_n} = \frac{ar^n(r-1)}{ar^{n-1}(r-1)} = r$$

$$(الف) \quad (13)$$

$$a, a+d, a+2d, \dots, a+(n-1)d \Rightarrow \text{مجموع} = \text{تعداد} \times \text{میانگین} \times \frac{1}{2}$$

$$n \times \left(\frac{a + a + (n-1)d}{2} \right) = \frac{n}{2} (2a + (n-1)d)$$

$$S_n = a, ar, ar^2, \dots, ar^{n-1}$$

$$ar \Rightarrow S_r = ar, ar^2, \dots, ar^n \Rightarrow S_n - S_r = a - ar^n$$

$$S_n(1-r) = a(1-r^n) \Rightarrow S_n = \frac{a(1-r^n)}{1-r} = \frac{a(r^n-1)}{r-1} \quad (ب)$$