

1/1/10

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

$$a_1 = \frac{1}{r} \times r^0 = \frac{1}{r} = 256$$

$$a_1 = \frac{a_{13}}{r^{12}} = \frac{a_1}{r^{12}} = r^{12} \Rightarrow r^{12} = 16$$

① (10, 256, 16) و (10, 256, 16)

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$$2.1) a_1 = a_9 = \frac{1}{r} \times r^8 = r \quad a_1 = \frac{1}{r} \times r^9 = 256$$

$$b^9 = a \times c \rightarrow 256 \times r = a^9 \rightarrow \frac{1}{r} \times r^9 = \boxed{256}$$

المسألة غريبة لأن (10, 256, 16) و (10, 256, 16) و (10, 256, 16)

$$1.1) 128 = \frac{1}{r} \times r^{n-1} \rightarrow 128 = r^{n-1} = r^8 \Rightarrow r = 2 \quad n=9$$

$$\frac{a_1}{a_9} = \frac{1}{r^8} = \frac{1}{16} \rightarrow r^8 = 16 \rightarrow r = 2 \quad a = \frac{1}{r} = \frac{1}{2} = \frac{1}{2}$$

④

$$a_1 = a \times r^9 = \frac{1}{r} \times r^9 = r^8 = 256$$

$$a_1 \times a_2 \times a_3 \times a_4 \times a_5 \times a_6 \times a_7 \times a_8 \times a_9 = \frac{a}{r} \times \frac{a}{r} \times \frac{a}{r} \times \frac{a}{r} \times \frac{a}{r} \times \frac{a}{r} \times \frac{a}{r} \times \frac{a}{r} \times \frac{a}{r} = a^9 = 256 \rightarrow a = 2$$

③

$$a_1 \times a_2 = \frac{a}{r} \times \frac{a}{r} = \frac{a^2}{r^2} = 9 \Rightarrow a^2 = 9 \Rightarrow a = 3$$

1.1

$$a^a \times b^b = \sqrt{r} \rightarrow r^{a+b} = \sqrt{r} \rightarrow r^{a+b} = r^{\frac{1}{2}} \rightarrow a+b = \frac{1}{2}$$

⑤

$$b = \frac{a+c}{r} \rightarrow \frac{a}{r} = \frac{1}{2}$$

⑥

⑦ (10, 256, 16) و (10, 256, 16) و (10, 256, 16)

$$x = \frac{1}{1-x} \rightarrow x(1-x) = 1 \rightarrow x - x^2 = 1 \rightarrow x^2 - x + 1 = 0$$

$$x^2 - x + 1 = 0 \rightarrow x = \frac{1 \pm \sqrt{1-4}}{2} = \frac{1 \pm \sqrt{-3}}{2} = \frac{1 \pm i\sqrt{3}}{2}$$

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فقط $\frac{\sqrt{3}}{2}$ و $\frac{1}{2}$

$$\begin{aligned} a_1 + a_2 &= 11 \rightarrow aq^2 + a = 11 & a(1+q^2) &= 11 \\ & & \rightarrow aq(1+q) &= 11 \end{aligned}$$

$$a_2 + a_3 = 12 \rightarrow aq + aq^2 = 12$$

$$\frac{aq(1+q^2)}{aq(1+q)} = \frac{11}{12} \rightarrow \frac{(1+q)(1+q^2)}{q(1+q)} = \frac{11}{12}$$

$$\rightarrow 12 - 12q + 12q^2 = 11q \rightarrow 12q^2 - 10q + 1 = 0 \quad \Delta = 100 - 48 = 52$$

$$q = \frac{10 \pm \sqrt{52}}{24} \rightarrow \frac{10+1}{12} = \frac{11}{6} \rightarrow \frac{10-1}{12} = \frac{1}{4}$$

(ج)

$$\begin{aligned} 1, 11, 121, 1331, 14641, \dots \\ 1, 11, 121, 1331, 14641, \dots \end{aligned} \rightarrow \text{نسبة} = 11$$

$$\begin{aligned} a_1 \times a_2 \times a_3 &= 11 \rightarrow a_1^3 = 11, a_2 = 11, a_3 = 11 \quad (1, 11) - 11 \\ \frac{11}{q} + 11 + 11q &= 11 \rightarrow q = 1 \\ 11 - 10q + 11q^2 &= 0 \rightarrow q = \frac{1}{11} \end{aligned}$$

$$S_n = a_1 \left(\frac{q^n - 1}{q - 1} \right) = \frac{11(11^n - 1)}{11 - 1} = 11^n - 1 \quad (الف - 1)$$

$$(1, 11, 121, 1331, 14641, \dots) = (11^0, 11^1, 11^2, 11^3, 11^4, \dots) = 11^0 \times 11^1 \times 11^2 \times 11^3 \times 11^4 \times \dots$$

$$\begin{aligned} (1, 11, 121, 1331, 14641, \dots) &= 1, 11, 121, 1331, 14641, \dots \\ (1, 11, 121, 1331, 14641, \dots) &= (11^0, 11^1, 11^2, 11^3, 11^4, \dots) \rightarrow 11(1-11) + 11^2(1-11) + \dots \end{aligned}$$

قد نستطيع ان نلاحظ ان النسبة بين اعداد المتكاملة هي 11.

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

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

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

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

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

$$1) S_n = a + aq + aq^2 + \dots + aq^{n-1}$$

$$S_n \times q = aq + aq^2 + \dots + aq^n$$

$$\rightarrow S_n - S_n q = a - aq^n \Rightarrow S_n(1 - q) = a(1 - q^n)$$

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