

۱	$a_n = a_1 r^{n-1}, \quad \frac{1}{r} = r^{n-1} = r^{n-2}$ ا) $a_1 = r^{6-2} = r^4 = \frac{r^6}{r^2} = \frac{16}{4} = 4$ ب) $\frac{a_{10}}{a_1} = \frac{r^{10}}{r^1} = r^9 = 16 \Rightarrow r^9 = 16$ ج) $\sqrt{a_n} = a_1, \quad \sqrt{r^2 \times r^4} = \sqrt{r^6} = r^3 = 4$ د) $a_n = r^{n-2} = 16 \Rightarrow r^9 = 16$ $n-2 = 9 \Rightarrow n = 11$ جمله ۱۱ام
۲	$t_0 = 12, \quad t_n = 96$ $\frac{t_n}{t_0} = \frac{ar^n}{ar^0} = \frac{96}{12} \Rightarrow r^3 = 8 \Rightarrow r = 2$ $t_0 = 12 = a(r)^0$ $a = \frac{12}{1} = 12$ $a_n = \frac{r}{r-1} \times (r)^{n-1}$ $t_1 = \frac{r}{r-1} \times r^0 = \frac{3}{2-1} = 3$
۳	$a^0 = ar^1 = 16 \times 2 = 32$ $(ar)^0 = 16 \Rightarrow ar^2 = 16$ ا) $a_3 = a_1 r^2 = 16$ ب) $a_1 \times a_9 = (a_5)^2 = 16^2 = 256$
۴	$r^a \times r^b = (r^{\sqrt{a} \sqrt{b}})^2$ $a \times b = 16 \Rightarrow 4 \times 4 = 16$ $a + b = 8$ $\frac{a \times b}{r} = \frac{16}{2} = 8$
۵	$x^2 = 1-x, \quad x^2 = x, \quad x^2 = 1+x$ $x^2 = (1-x)(1+x)$ $x^2 = 1-x^2$ $2x^2 = 1$ $x^2 = \frac{1}{2} \Rightarrow x = \pm \sqrt{\frac{1}{2}} = \pm \frac{\sqrt{2}}{2}$

$$a, ar^m, r^m$$

$$\frac{1 - r^{m+1}}{1 - r} = r^m \rightarrow r(1 - r^m) = r^m(1 - r)$$

$$a, ar^m, r^m$$

$$ar(1-r) = r^m$$

$$a = \frac{r^m}{r(1-r)}$$

$$r^m - r^m - r^m + r^m = 0$$

$$r = r, \frac{1}{r}, \dots$$

$$\begin{cases} r = r, a = 1 \rightarrow 1, 5, 9, (4, 2) \\ r = \frac{1}{r}, a = r \rightarrow (2, 5), 9, r, 1 \end{cases}$$

$$a, ar, ar^2$$

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

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

$$(ar)^m = r^m$$

$$ar = r \rightarrow a = \frac{r}{r}$$

$$a, r^m + r^m = 1$$

$$a + r^m = 1 - r^m = 0$$

$$\frac{r}{r} + r^m = 0 \rightarrow r^m = -1, r = r, \dots$$

$$r, r \leq \frac{1}{r}$$

$$9, r, 1$$

$$1, r, 9 \leftarrow r = \frac{1}{r}, a = r$$

$$s_n = a_1 \left(\frac{a^n - 1}{a - 1} \right)$$

$$s_{10} = r \left(\frac{r^{10} - 1}{r - 1} \right) = \frac{r^{10} - 1}{r - 1}$$

$$a, ar, \dots, ar^9 = a_1, ar^{10} = a_1, ar^{10} = a_1, ar^{10} = a_1, ar^{10} = a_1, ar^{10} = a_1, ar^{10} = a_1, ar^{10} = a_1, ar^{10} = a_1, ar^{10} = a_1$$

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

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

$$a(1-r), ar(1-r), ar^2(1-r), \dots$$

$$a(1-r), ar(1-r), ar^2(1-r), \dots$$

$$a(1-r), ar(1-r), ar^2(1-r), \dots$$

$$\frac{ar(1-r)}{a(1-r)} = r$$