

$a_n = \frac{1}{r}, 1, r, \dots$ $a_n = ar^{n-1} = \frac{1}{r} \times r^{n-1} = r^{n-2}$ الف) $a_{10} = ? \rightarrow r^8 = 254$ ب) $\frac{a_{14}}{a_{12}} = ? \rightarrow \frac{r^{12}}{r^{10}} = r^2 = 14$ ج) $q^2 = \frac{r^8}{r^2} \Rightarrow q^2 = r^6 \Rightarrow q = \pm 1 \rightarrow 4 \times 1 = 32$ $6 - 32$ د) $t_n = r^7 \rightarrow n = 9$	۱
$a_5 = 12$ $r^3 = \frac{94}{12} = 1 \rightarrow r = 1$ $a_8 = 94$ $r^2 = r^2 = 4$ $a_{10} = ?$ $a_{10} = 94 \times 4 = 376$	۲
$a_{13} = 243 \rightarrow a_{13} = 27$ (الف) ب) $a_1 \times a_5 = a_{13} = 9$	۳
$3r = r^{a+b} \rightarrow a+b = 3$ $\frac{a+b}{r} = \frac{a}{r} = 1, 0$	۴
$a_{13} = 1-x$ $a_{15} = x$ $a_{11} = x+1$ $1-x^2 = x^2$ $2^4 = 1 \rightarrow x = \pm 1$	۵

$\frac{27}{\times 27} = 1$
 $\frac{27}{27} = 1$
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$a_1 + a_8 = 2A$ $a_1 + a_8 = 12$ $a_1 + a_1 r^7 = 2A \rightarrow a_1(1+r^7) = 2A \rightarrow a_1 = \frac{2A}{1+r^7}$ $a_1 r + a_1 r^8 = 12 \rightarrow \frac{2A}{1+r^7} (r+r^8) = 12$ $\Rightarrow 2A(r+r^8) = 12(1+r^7) \rightarrow 4r + 4r^8 = 12 + 12r^7 \rightarrow 4r^8 - 12r^7 + 4r - 12 = 0$ $r = 3 \leq r = \frac{1}{3}$ $1, 3, 9, 27$ $27, 9, 3, 1$ ~ 27	6
$a_1(1+r+r^2) = 12$ $a_1 r \times r^2 = 27$ $a_1 r = 3 = a_1$ $\frac{12}{r} + 3 + 3r = 12$ $\frac{1}{r} + 1 + r = \frac{12}{3}$ $\frac{r^2 + r + 1}{r} = \frac{12}{3} \rightarrow 3r^2 + 3r + 3 = 12r \rightarrow 3r^2 - 10r + 3 = 0$ $r = \frac{10 \pm \sqrt{100-36}}{6} = \frac{10 \pm 8}{6} \rightarrow r = \frac{1}{3}$ $1, 3, 9$ $9, 3, 1$	7
$S_{10} = X \left(\frac{r^{10}-1}{r-1} \right) = r^{10} - 1 = 29.4A$ $\Rightarrow a_1 \times r^{10} = 29.4A$ $a_1 \times r^{10} = a_1 \times r^{10} = r^{10} \times r^{10}$	8
$a_1 \xrightarrow{\times q} a_1 q \xrightarrow{\times q} a_1 q^2 \xrightarrow{\times q} a_1 q^3 \dots \rightarrow a_1 q^{n-1}$ $+ a_1(q-1) \xrightarrow{\times q} + a_1 q(q-1) \xrightarrow{\times q} + a_1 q^2(q-1) \dots \rightarrow a_1 q^{n-1} \rightarrow a_1 = a_1(q-1)$ $+ a_1(q-1)(q-1) \xrightarrow{\times q} + a_1 q(q-1)(q-1) \dots \rightarrow a_1 q^{n-1} \rightarrow a_1 = a_1(q-1)(q-1)$ $\vdots$	9
$a_1 + a_4 = a_2 + a_5 = a_3 + a_6 = a_1 + a_8 = a_2 + a_7 = 2A$ $S_4 = 2(a_1 + a_4) = \frac{n}{2}(a_1 + a_n) = \frac{n}{2}(a_1 + a_8)$ $S_8 = 2(a_1 + a_8) + \frac{1}{2}(a_1 + a_8) = \frac{5}{2}(a_1 + a_8) = \frac{n}{2}(a_1 + a_n)$ $\Rightarrow S_n = a + ar + ar^2 + \dots, S_n r = ar + ar^2 + ar^3 + \dots$ $S_n r - S_n = (ar + ar^2 + \dots) - (a + ar + \dots)$ $S_n r - S_n = ar^n - a$ $S_n(r-1) = a(r^n - 1) \rightarrow S_n = a \left(\frac{r^n - 1}{r - 1} \right)$	10