

الف) $r^{-1}, r^0, r^1, r^2, \dots \rightarrow a_n = r^{n-1} \rightarrow a_{10} = r^9 = 289 \rightarrow q = r$

ب) $\frac{a_{10}}{a_1} = q^9 = (r)^9 = 19$

ج) $a_1 \oplus a_{10} \rightarrow a_n = r^{\Delta} = r^9$

د) $128 = r^{n-1} \rightarrow r^9 = r^{n-1} \rightarrow n-1=9 \rightarrow n=10$

$a_8 = 12$ $a_1 = 99 \rightarrow q = \sqrt[8]{\frac{99}{12}} = \sqrt[8]{1} = 1$

$a_{10} = a_1 \times q^9 = 99 \times 1 = 99$

$a_1 \times a_2 \times a_3 \times a_4 \times a_5 = r^5 = (a_1)^5 \rightarrow a_5 = r$

الف) $a_5 = r$

ب) $(a_5)^5 = r^5 = 9$

$r^a, \frac{\varepsilon \sqrt{r}}{r}, r^b \rightarrow \frac{a+b}{r} = \frac{1}{r}$

$1-n, n, n+1 \rightarrow \frac{n+1}{n} = \frac{n}{1-n} = \frac{q}{r}$
 a_n, a_n, a_{n+1}

$\frac{n+1}{n} = \frac{n}{1-n} \rightarrow 1-n^2 = n^2 \rightarrow n^2 = 0.5 \rightarrow n = \pm \sqrt{0.5}$

$n = \pm \sqrt{0.5}$

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a_1, a_r, a_c, a_v
 $1 \rightarrow r \rightarrow q \rightarrow \boxed{rV}$
 $a + aq^r = rV \rightarrow a(1+q^r) = \frac{a(1+q)(1+q^r-q)}{aq(1+q)} \cdot \frac{1+q^r-q}{q} = \frac{V}{c}$
 $aq + aq^r = rV \rightarrow aq(1+q) = \dots$
 $a + aq^r = rV \rightarrow a(1+rV) = rV \rightarrow a = 1 \left\{ a\left(\frac{r}{q}\right) = rV \rightarrow a = rV \rightarrow \sqrt{rV}, q, c, 1 \right\}$

$a_1 + aq + aq^r = rV \rightarrow aq\left(\frac{1}{q} + 1 + q\right)$
 $a_1 + aq + aq^r = rV \rightarrow a^c q^c = (aq)^r = rV \rightarrow \frac{a_r}{aq} = r$

$r\left(\frac{1}{q} + 1 + q\right) = 1c \rightarrow \frac{r}{q} + r + cq = 1c \rightarrow \frac{r}{q} + cq = 1c - r$
 $a_{1..r} = \boxed{1, r, q} \leq \boxed{q, c, 1} \rightarrow q = \left\{ r, \frac{1}{c} \right\}$

الف) $S_{1..} = r \left(\frac{r^{10}-1}{r-1} \right) = r^{10}-1 = 29049-1 = \boxed{29048}$

ب) $a_{10} = r \times q^9 = r \times (r^9) \rightarrow a_1 + a_r + a_c + \dots + a_{10} = (r \times r \times r^9)^d$
 $= (r^r \times c^q)^d = \boxed{r^{10} \times r^{9d}}$

$a_n: a, aq, aq^r, aq^c, aq^q, \dots$
 $\left. \begin{array}{l} a(q-1) \downarrow a(q^r-q') \downarrow \\ a(q^r-q) \quad a(q^c-q^r) \end{array} \right\} \begin{array}{l} a_n: \xrightarrow{\times q} \xrightarrow{\times q} \\ a(q-1), a(q^r-q'), a(q^c-q^r) \end{array}$
 $q' = \frac{q^r-q'}{q-1} = \frac{q(q^{r-1}-1)}{q-1} = q$
 $\boxed{q' = q}$

$S_n = (a + (a+ad) + (a+2ad) + \dots + (a+(n-1)ad)) \rightarrow rS_n = (ra + (n-1)ad) \cdot n$
 $S_n = (a + (n-1)ad) + \dots + (a+ad) + (a+ad) \rightarrow S_n = \frac{n}{r} (rn + (n-1)ad) \checkmark$

$q(a + aq + aq^r + \dots + aq^{n-r} + aq^{n-1}) = S_n = aq + aq^r + aq^c + \dots + aq^n = q \cdot S_n$
 $aq^n + S_n - a = q \cdot S_n \rightarrow aq^n - a = S_n(q-1) \rightarrow a(q^n-1) = S_n(q-1)$
 $\rightarrow S_n = a \frac{q^n-1}{q-1} \checkmark$