

الف) $a_{1,x} r^{n-1} \rightarrow a_{1,0} = \frac{1}{r} x r^9 = 204$ ج) $a_r a_{1,0} = a_r \rightarrow a_r = \frac{1}{r} x r^9 = 32$
ب) $\frac{a_{1,r}}{a_{1,3}} = \frac{a_{1,9}}{a_{1,12}} = q^f = r^f = 14$ د) $\frac{1}{r} x r^{n-1} = 121 \Rightarrow r^{n-1} = 204 \Rightarrow n=9$
جمله نهم ← 5

$$\frac{a_1}{a_0} = q^r = \frac{94}{12} = 1 \Rightarrow q = 1$$

$$a_\Delta = 1r \Rightarrow a_1 q^{\Delta-1} = 1r \Rightarrow a_1 r^f = 1r \Rightarrow a_1 = \frac{r}{r^f} \rightarrow a_1 \cdot a_1 q^9 = \frac{r}{r^f} \times r^9 = r^9 \wedge r^f$$

$a_1 \times a_r \times a_r \times a_r \times a_0 = r^r r \Rightarrow a_r^\Delta = r^r r \Rightarrow a_r = \sqrt[r]{r^r r} = r$

$\downarrow$
 $a_r = \sqrt[r]{r^r r} = r$ الف

$a_1 \times a_0 = a_r \times a_r = r \times r = 9$ ب

$$r^a, r\sqrt{r}, r^b \rightarrow r^a \times r^b = (r\sqrt{r})^r \Rightarrow r^{a+b} = r^r = r^0 \Rightarrow a+b=0$$

$$\frac{a+b}{r} = \frac{0}{r} = 0$$

$$\left. \begin{array}{l} a_r = 1 - x \\ a_v = x \\ a_{11} = x + 1 \end{array} \right\} \Rightarrow a_r \times a_{11} = a_v \times a_v \Rightarrow (x+1)(1-x) = x^r \Rightarrow 1 - x^r = x^r$$

$$\Rightarrow x^r - 1 = 0 \Rightarrow x^r = 1 \Rightarrow x = \pm \sqrt[r]{1} = \pm \frac{\sqrt[r]{r}}{r}$$

$$\begin{aligned}
 a_1 + a_r &= 2\lambda \rightarrow a_1 + a_1 q^r = 2\lambda \Rightarrow a_1(1 + q^r) = 2\lambda \Rightarrow a_1(1 + q)(1 - q + q^r) = 2\lambda \\
 a_r + a_r &= 1r \rightarrow a_1 q + a_1 q^r = 1r \Rightarrow a_1 q(1 + q) = 1r \\
 \frac{a_1 + a_r}{a_r + a_r} &= \frac{a_1(1 + q)(1 - q + q^r)}{a_1 q(1 + q)} \Rightarrow \frac{1 - q + q^r}{q} = \frac{2\lambda}{1r} = \frac{v}{r} \Rightarrow vq = r - rq + r^2 q^r \\
 &\Rightarrow r^2 q^r - 10q + r = 0 \quad q < \frac{1}{r} \\
 &\hookrightarrow q^r - 10q + q = 0 \rightarrow (q - 1)(q - 9) = 0 \rightarrow q < \frac{1}{9} \\
 a_1(1 + q^r) &= 2\lambda \left\{ \begin{array}{l} a_1(1 + rv) = 2\lambda \Rightarrow a_1 = 1 \\ a_1(1 + \frac{1}{rv}) = 2\lambda \Rightarrow a_1 = rv \end{array} \right. \\
 a_n &\left\{ \begin{array}{l} 1, r, q, rv \rightarrow a_r = rv: \text{بزرگترین جمله} \\ rv, q, r, 1 \rightarrow a_1 = rv: \text{بزرگترین جمله} \end{array} \right.
 \end{aligned}$$

$$a_1 + a_r + a_r = 13 \rightarrow \frac{a_r}{q} + a_r + a_r q = 13 \Rightarrow \frac{1}{q} + r + r q = 13 \quad -V$$

$$a_1 \times a_r \times a_r = 27 \rightarrow a_r^3 = 27 \Rightarrow a_r = 3$$

$$a_r \times a_r$$

$$\frac{1}{q} + 3q = 10$$

$$\Rightarrow 3 + 3q^2 = 10q \Rightarrow 3q^2 - 10q + 3 = 0 \Rightarrow q < \frac{1}{3} = r$$

$$(3q^2 - 10q + 3 = 0 \Rightarrow (q-1)(q-9) = 0$$

$$a_n \begin{matrix} & 1 & 3 & 9 \\ & \swarrow & & \searrow \\ a_n & 9 & 3 & 1 \end{matrix}$$

$$a_n = 2, 4, 1, \dots$$

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$$الف) S_{10} = a_1 \left(\frac{q^{10} - 1}{q - 1} \right) = 2 \left(\frac{3^{10} - 1}{3 - 1} \right) = 3^{10} - 1 = 59049$$

$$ب) a_1 \times a_2 \times a_3 \times \dots \times a_{10} = (a \times a_{10})^5 = (2 \times 2 \times 3^9)^5 = 2^5 \times 3^{45}$$

$$a_n = a, aq, aq^2, aq^3, aq^4, \dots$$

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$$aq - a = a(q-1)$$

$$aq^2 - aq = aq(q-1)$$

$$aq^3 - aq^2 = aq^2(q-1)$$

$$aq^4 - aq^3 = aq^3(q-1)$$

$$a_n' = a(q-1), aq(q-1), aq^2(q-1), aq^3(q-1), \dots$$

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$$\text{نسبت} = \frac{aq(q-1)}{a(q-1)} = \frac{aq^2(q-1)}{aq(q-1)} = \frac{aq^3(q-1)}{aq^2(q-1)} = q$$

$$الف) a_1, a_1 + d, a_1 + 2d, a_1 + 3d, \dots, a_1 + (n-1)d$$

-1

$$a_1 + (n-1)d, a_1 + (n-2)d, a_1 + (n-3)d, \dots, a_1$$

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$$rS_n = n(a_1 + a_{n-1}) \Rightarrow S_n = \frac{n}{2}(2a_1 + (n-1)d)$$

$$ب) S_n = a_1 + a_1q + a_1q^2 + \dots + a_1q^{n-1} \quad \text{طرفین را در } q \quad S_n q = a_1q + a_1q^2 + a_1q^3 + \dots + a_1q^n$$

$$S_n - S_n q = a_1 - a_1q + a_1q - a_1q^2 + a_1q^2 - a_1q^3 + \dots - a_1q^{n-1} + a_1q^{n-1} - a_1q^n$$

$$S_n(1-q) = a_1(1-q^n)$$

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