

$$S_3 = a_1 \left(\frac{q^3 - 1}{q - 1} \right) = 11 \Rightarrow a_1 (q^2 + q + 1) = 11$$

$$a_1 a_2 a_3 = a_1^3 \Rightarrow a_1^3 = 11 \Rightarrow a_1 = \sqrt[3]{11}$$

$$\varepsilon q^2 + \varepsilon q + \varepsilon = 11q$$

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

$$\rightarrow q = \varepsilon \rightarrow \text{حاصل} \Rightarrow X$$

$$\boxed{q = \frac{1}{\varepsilon}} \checkmark$$

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$$n^2 + \varepsilon, 2n, n^2 - 2 \quad \text{در حالت صحیح} \quad \varepsilon q, 1$$

$$\frac{2n}{n^2 + \varepsilon} = \frac{n^2 - 2}{2n} \quad x^2 + \varepsilon x^2 - 2n^2 - 1 = \varepsilon n^2 \Rightarrow n^2 - 2n^2 - 1 = 0$$

$$(n^2 + 2)(n^2 - \varepsilon) = 0 \quad \text{ماتر - معادله} \quad \Rightarrow 1, \varepsilon, 2 \Rightarrow q = \frac{1}{\varepsilon}$$

$$S_4 = a_1 \left(\frac{q^4 - 1}{q - 1} \right) = 1 \left(\frac{1 - \frac{1}{16}}{1 - \frac{1}{\varepsilon}} \right) = 1 \left(\frac{\frac{15}{16}}{\frac{\varepsilon - 1}{\varepsilon}} \right) = \boxed{\frac{15\varepsilon}{16}}$$

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$$q^4 + q^3 + q^2 + q + 1 = \frac{121}{11}$$

$$a_1 = 121$$

$$S_5 = a_1 (q^4 + q^3 + q^2 + q + 1) \Rightarrow = 121 \times \frac{121}{11} = \boxed{343}$$

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$$1, \dots, A, \dots, 4\varepsilon \rightarrow \text{حاصل} \Rightarrow A = \frac{1 + 4\varepsilon}{\varepsilon} = \frac{4\varepsilon}{\varepsilon} = 32, 15$$

$$1, \dots, B, \dots, 4\varepsilon \rightarrow \text{حاصل} \Rightarrow B^2 = AC \Rightarrow B^2 = 4\varepsilon \Rightarrow B = \pm 2$$

$$\begin{cases} A + B = 32, 15 + 1 = 33, 15 \end{cases}$$

$$\begin{cases} A + B = 32, 15 - 1 = 31, 15 \end{cases}$$

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$$-2\varepsilon, -\frac{9\varepsilon}{2}, \dots \rightarrow -2\varepsilon, -\frac{23, 17\varepsilon}{2}, \dots \Rightarrow a_n = -2\varepsilon + (n-1) \cdot \frac{1}{\varepsilon}$$

$$n=61 \Rightarrow -2\varepsilon + \frac{20}{\varepsilon} \times \frac{1}{\varepsilon} = 1$$

$$12, 18, a_2, \dots \rightarrow a_n = 12 \times q^{n-1}$$

$$n=18 \Rightarrow 12 \times q^{\frac{18}{n-1}}$$

$$12 \times q^{\frac{18}{n-1}} = 1 \Rightarrow \boxed{q = \frac{1}{12}}$$

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$a_r \rightarrow a_v \rightarrow a_q$ $a_1 + r d, a_1 + 4d, a_1 + 16d$ $\frac{a_1 + r d}{a_1 + 4d} = \frac{a_1 + 16d}{a_1 + 4d} \Rightarrow a_1 r + 16da + 4rd^2 = a_1 r + 16ad + 4rd^2 \quad r d^2 = -2ad$ $r d (1 + d + a) = 0 \Rightarrow \begin{cases} d = 0 \Rightarrow a_1 \\ d = -\frac{a}{1+a} \end{cases}$ دون المثلثات في المثلثات	6
a_r, a_s, a_Λ $a_1 + d, a_1 + 4d, a_1 + 16d$ $\frac{a_1 + r d}{a_1 + 4d} = \frac{a_1 + 16d}{a_1 + 4d} = q = r$ $a_1 r + 4rd^2 + 4ad = a_1 r + 16ad + 16rd^2$ $r d^2 = 2ad$ $d(d-a) = 0 \Rightarrow \begin{cases} d = 0 \Rightarrow a_1 \\ d = a \Rightarrow q = r \end{cases}$ $a_n = a_1 q^{n-1} \Rightarrow a_1 = \frac{1}{2} \Rightarrow q = r \rightarrow n = 10 \rightarrow$ $a_{10} = \frac{1}{2} \times r^9 = r^9 = 128$	7
$r a_r, r a_s, a_\Lambda$ $r a_1, r a_4, a_7$ $r a_1 + r d, r a_1 + 4r d, a_7$ $r a_1 + r d = r a_1 + 4r d = a_7$ $r d = 3r d \Rightarrow d = 0$ $(q-1)(q-3) = 0 \Rightarrow \begin{cases} q = 1 \\ q = 3 \end{cases}$	8
$r, \frac{1}{r}, \dots$ $a_n = r \frac{n(n-1)}{2} = \frac{n(n-1)}{2} = \frac{n-n}{2}$ $\frac{\frac{n}{2} + n}{\frac{n}{2} - 1} = \frac{\frac{1}{2} + n}{\frac{1}{2} - 0} = -1 + n$ $\frac{n-1}{n+1} = \frac{n+1}{n+1} \Rightarrow \frac{n-1}{n+1} = \frac{n+1}{n+1} \Rightarrow 14n + 1 + 14n = 14n + 1 + 14n$ $14n = -21 \Rightarrow n = -\frac{21}{14}$ $q = \frac{-r d}{\frac{n}{2} - 1} = \frac{-\frac{1}{2}}{\frac{1}{2} - 1} = \frac{\frac{1}{2}}{\frac{1}{2}} = 1$	9
$a_1 + a_s + a_v = a_1 (1 + q^3 + q^4) = v r$ $a_1 + d = a q^3 \Rightarrow d = a(q^3 - 1)$ $a + 4d = a q^4 \Rightarrow 4d = a(q^4 - 1)$ $\frac{d}{d} = \frac{a(q^4 - 1)}{a(q^3 - 1)}$ $q = q^3 + 1 \Rightarrow q^3 = 1 \Rightarrow q = r \Rightarrow a(v r) = v r \Rightarrow a = 1$ $1, 1, 4 \Rightarrow \begin{cases} a + d = 1 \\ a + 4d = 4 \end{cases} \Rightarrow a = 1 \Rightarrow \boxed{d = 1} \vee \boxed{d = 0}$	10

⑦ $d = a(q^3 - 1)$

$$a + 4d = a q^4 \Rightarrow a(1 + 4(q^3 - 1)) = a q^4 \Rightarrow q^4 - 4q^3 + 1 = 0$$

$$(q^3 - 1)(q - 1) = 0 \Rightarrow \begin{cases} q^3 = 1 \\ q = 1 \end{cases} \Rightarrow \boxed{d = 0}$$