

$$a \times a q \times \frac{q}{2} = a^3 = 44 \rightarrow a = 4$$

$$\frac{a}{2} + a + a q = 1 \Rightarrow \frac{4}{2} + 4 + 4q = 1 \Rightarrow 2 + 4 + 4q = 1 \Rightarrow 4q = -5 \Rightarrow q = -\frac{5}{4}$$

عدد صحیح نیست پس قابل قبول نیست

$$t^2 = n^2 + 2n^2 - 1 \rightarrow n^2 - 2n^2 - 1 = 0 \xrightarrow{+1} t^2 - 2t - 1 = 0 \rightarrow (t-4)(t+2)$$

$$\rightarrow t=4 \rightarrow n^2=4 \rightarrow n=\pm 2 \xrightarrow{+2} 1, 4, 2 \checkmark \quad t=4 \quad t=2$$

$$\xrightarrow{-2} 1, -4, 2 \times \rightarrow n=2, q=\frac{1}{2}$$

عدد صحیح قابل قبول

$$S_v = \frac{a(q^v - 1)}{q - 1} = \frac{1\left(\left(\frac{1}{2}\right)^v - 1\right)}{\frac{1}{2} - 1} = \frac{1 \times \frac{-127}{128}}{-\frac{1}{2}} = \frac{\frac{127}{128}}{\frac{1}{2}} = \frac{127}{64}$$

$$1 + q + q^2 + q^3 + q^4 = \frac{121}{11} \xrightarrow{\times a} a + aq + aq^2 + aq^3 + aq^4 = \frac{121a}{11}$$

مجموع ۵ جمله اول

$$\rightarrow \frac{121}{11} \times 223 = 2443$$

$$d = \frac{44-1}{4} \rightarrow d = 10.75 \rightarrow 1, 11, 15, 22, \textcircled{33}, 44, 55, 66$$

$$q^2 = \frac{44}{1} \rightarrow q = \pm 2 \rightarrow \begin{cases} q=2 \rightarrow 1, 2, 4, \textcircled{8}, 16, 32, 64 \\ q=-2 \rightarrow 1, -2, 4, \textcircled{-8}, 16, -32, 64 \end{cases}$$

$$A + B \rightarrow \begin{cases} 33 + 8 = 41 \\ 33 - 8 = 25 \end{cases}$$

$$d = \frac{1}{4} \rightarrow a_1 = \frac{1}{4} + n = -24 \rightarrow n = -\frac{95}{4} \rightarrow a_{1,1} = \frac{1}{4} - \frac{95}{4} = \frac{4}{4} = 1$$

$$a q^{n-1} = 1 \rightarrow 128 \times q^7 = 1 \rightarrow 2^7 \times q^7 = 1 \rightarrow (2q)^7 = 1 \rightarrow 2q = 1 \rightarrow q = \frac{1}{2}$$

$$(a+9d)^2 = (a+2d)(a+10d) \rightarrow a^2 + 36d^2 + 18ad = a^2 + 14d^2 + 10ad \rightarrow 2d^2 - 8ad$$

$$\rightarrow 2d = -2a \rightarrow d = \boxed{\frac{-1}{10}a}$$

$d=0$ → چون صورت سوال گفته مجلات متایزند

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$$(a+2d)^2 = (a+d)(a+3d) \rightarrow a^2 + 4d^2 + 4ad = a^2 + 3d^2 + 3ad \rightarrow d^2 = ad$$

$$\rightarrow d^2 = ad \rightarrow d = \frac{a}{d}$$

چون مجلات متایزند قابل قبول نیست

$$\hookrightarrow d = a \rightarrow 2d, 4d, 6d \rightarrow q = 2$$

$$\rightarrow a_1 = a q^9 = \frac{1}{4} \times 2^9 = \boxed{128}$$

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$$3ar, 2ar, ar, - \rightarrow r(2aq^2) = 3aq + aq^3 \rightarrow 2aq^2 = aq(r+q^2)$$

$$\rightarrow 2q = r+q^2 \rightarrow q^2 - 2q + r = 0 \rightarrow (q-1)(q-r) = 0$$

$$\rightarrow \boxed{q=3}$$

چون مجلات متایزند قابل قبول نیست

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$$a_f, a_n, a_{13} \rightarrow a_e, a_e + 4d, a_e + 9d \xrightarrow{+b} a_e + b, a_e + 4d + b, a_e + 9d + b$$

$$\xrightarrow{a+b=c} c, c+4d, c+9d \Rightarrow (c+4d)^2 = c(c+9d)$$

دنباله حسابی

$$\rightarrow c^2 + 14d^2 + 18cd = c^2 + 9cd \rightarrow 14d = c \rightarrow q = \frac{c+4d}{c} = \frac{c+4d}{c} = \frac{c+4d}{c} = \frac{2}{1} = \boxed{\frac{2}{1}}$$

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$$a_1, a_5, a_9, a_{13} \rightarrow a(a+4d) = (a+d)^2 \rightarrow a^2 + 4ad = a^2 + d^2 + 2ad \Rightarrow d^2 - 2ad = 0$$

$$\rightarrow d(d-2a) = 0 \rightarrow \boxed{d=0}$$

$$\hookrightarrow d=2a$$

$$a_1 + a_5 + a_9 = 15 \rightarrow a + a + d + a + 4d = 15 \rightarrow 3a + 5d = 15 \rightarrow 3a + 10a = 15 \rightarrow a = 1$$

$$\rightarrow \boxed{d=2}$$

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