

۱ و ۵، ۱۲، ۲۲، ...

$$n^2 + \frac{n(n-1)}{2}$$

$$100 + 4\Delta = 14\Delta \quad \checkmark$$

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زنجی: ۰، ۱، ۲، ۳، ... $\frac{n(n-1)}{2} = \Delta\Delta \Rightarrow n=11 \quad \checkmark$

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زنجی: $\Delta n+1$

$$\Delta \times 11 + 1 = 4\Delta \Rightarrow \checkmark$$

$$(11-1)\Delta = 40 \quad \checkmark$$

$$4\Delta + 40 = 1\Delta \Rightarrow \checkmark$$

$$1\Delta + 4\Delta = 130 \quad \checkmark$$

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$$d_1 = \frac{(-1)^1}{1} = -1 \quad a_2 = \frac{(-1)^2}{2} = \frac{1}{2} = 0,5 \quad a_3 = \frac{(-1)^3}{3} = -\frac{1}{3}$$

$$a_1 = -1 \quad a_2 = 0,5 \quad a_3 = -\frac{1}{3}$$

$$a_2 - d_1 = \frac{1}{2} - (-1) = \frac{1}{2} + 1 = \frac{3}{2} = 1,5 \quad \checkmark$$

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$$(-2)^r - v(r) = -41 \quad a_k = -\Delta k + 2r \Rightarrow a_k = b_r \Rightarrow -\Delta k = -v_0 \Rightarrow K=14 \quad \checkmark$$

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$$a_1 - a_v = 12 \Rightarrow 3d = 12 \Rightarrow d = 4 \Rightarrow a_4 - a_1 = \Delta d = \Delta x \varepsilon = 12 \quad \checkmark$$

(4)

$$a_n = a_1 + (n-1)d \Rightarrow a_7 = a_1 + a = v \Rightarrow (a_1 + 3d) - (a_1 + d) = 12 - v \Rightarrow 2d = 12 \Rightarrow d = 4$$

$$a_1 + a = v \quad v - \varepsilon = 3 \quad a_n = 3 + (n-1)4 = 4n - 1 \quad b_1 = a_1 = 3 \quad b_n = b_1 + (n-1)d$$

$$b_1 = 3 - \varepsilon = 1 \quad \boxed{b_n = 4n - 1} \quad a_n = 4n - 1 \quad \checkmark$$

$$b_1 = 3 \rightarrow \begin{cases} C + D = 3 \\ 4C + D = 11 \end{cases} \rightarrow C = 1, D = -8 \rightarrow b_n = 4n - 8$$

(1, 0)

$$\text{مورد: } d = 4, a_1 = 3$$

$$\text{مفروضه: } d = 4, b_1 = 1$$

$$t_n = \frac{4n-1}{4n+3} < \frac{3}{4}$$

$$4(4n-1) < 3(4n+3)$$

$$16n-4 < 12n+9 \quad 4n < 13 \Rightarrow n < 3.25 \quad \checkmark$$

$$n = 1, 2, 3, 4, 5, 6$$

این عبارت کوچکتر از 3/4 است.

(4)

$$t_n = 9, 9, 9, 9, \dots \quad t_n = An^2 + Bn$$

$$\left. \begin{aligned} A(1)^2 + B(1) &= 9 \Rightarrow A+B=9 \\ A(2)^2 + B(2) &= 9 \Rightarrow 4A+2B=9 \end{aligned} \right\} B = 9-A$$

$$4A + 2(9-A) = 9 \Rightarrow 4A + 18 - 2A = 9 \Rightarrow 2A = -9 \Rightarrow A = -4.5$$

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$$4A + 2B = 2(-4.5) + 2(9) = -9 + 18 = 9 \quad \checkmark$$

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$$A+B+C = -4$$

$$4A+2B+C = -9$$

$$9A+3B+C = 0$$

$$d = \frac{4-1}{4-2} = 1.5$$

$$t_v = v^2 - v - 4 = 49 - 7 - 4 = 40 \quad \checkmark$$

$$t_1 = -4 \quad t_2 = -9 \quad t_3 = 0$$

$$4A+B=9, \Delta A+B=4 \Rightarrow A=1 \Rightarrow t_n = n^2 - n - 4$$

$$b_n = 4 + \Delta(n-1) = \Delta n + 1 \Rightarrow n^2 - n - 4 = \Delta n + 1 \Rightarrow \Delta n = n^2 - n - 5$$

$$n^2 - 4n - 10 = 0$$

$$(n-9)(n+1) = 0 \xrightarrow{n \in \mathbb{N}} n = 9$$

(1, 0)