

$t_n = 1, 5, 17, 29, \dots \Rightarrow a = \frac{3}{2}$
 $t_1 = 1 = \frac{3}{2}(1) + b \Rightarrow b = -\frac{1}{2}$

$t_n = \frac{3}{2}n^2 - \frac{n}{2} \Rightarrow a_{10} = (\frac{3}{2} \times 100) + (-\frac{1}{2}) = 149$

$t_n = 0, 1, 3, \dots \Rightarrow t_n = \frac{n(n-1)}{2} \Rightarrow \frac{n(n-1)}{2} = 11 \Rightarrow n(n-1) = 22$
 $n = 11$

$t_n = 5, 13, 21, \dots \rightarrow t_n = 8n - 3 \rightarrow t_{11} = 8 \times 11 - 3 = 85$

$t_n = 5, 9, 13, \dots \rightarrow t_n = t_{n+1} \rightarrow t_{11} = 5 \times 11 + 1 = 56$

$\Rightarrow 85 + 56 = 141$

$a_1 = -1$
 $a_2 = \frac{1}{2}$
 $a_3 = -\frac{1}{4}$
 $a_4 = \frac{1}{8}$
 $\vdots$

$\left. \begin{array}{l} \text{کوچکترین} = a_1 = -1 \\ \text{بزرگترین} = a_2 = \frac{1}{2} \end{array} \right\} \frac{1}{2} - (-1) = \frac{3}{2}$

$b_3 = -27 - 21 = -48$
 $a_k = -5k + 22$

$\left\{ \begin{array}{l} -5k + 22 = -48 \Rightarrow 5k = 70 \rightarrow k = 14 \end{array} \right.$

$$a_1 - a_5 = 12 \rightarrow a + 4d - a - 4d = 12 \rightarrow 4d = 12 \rightarrow d = 3$$

$$a_4 - 1 \rightarrow a + 3d - a = 3d \rightarrow 3 \times 3 = 9$$

8

$$a_1 = 10 \Rightarrow d = \frac{10 - 1}{1} = 9 \rightarrow a_1 = 10, a_2 = 10 + 9 = 19$$

$$b_n = 11 \rightarrow a = 11 \rightarrow d = \frac{11 - 1}{1} = 10 \rightarrow b_n = 11n - 10$$

9

$$t_n = \frac{1}{5}, \frac{4}{5}, \frac{1}{9}, \frac{16}{11} \rightarrow t_n = \frac{1n - 1}{1n + 1} \rightarrow \frac{1n - 1}{1n + 1} < \frac{1}{1} \rightarrow 1n - 1 < 1n + 1$$

$$1n < 12$$

$$n < 12$$

جواب 4 و 5

10

$$t_n = 4, 9, 16, 25, \dots \rightarrow a = \frac{1}{4}, t_1 = 4 = \frac{1}{4} + b$$

$$b = \frac{15}{4}$$

$$c = \text{جواب} = 0$$

11

$$t_n = An^2 + Bn = \frac{1}{4}n^2 + \frac{15}{4}n \rightarrow A = \frac{1}{4}, B = \frac{15}{4}$$

$$\begin{cases} 4A + 15B = -\frac{9}{4} + \frac{15 \times 15}{4} \\ = \frac{44}{4} = 11 \end{cases}$$

$$t_n = -4, -1, 2, \dots \rightarrow a = \frac{1}{3} = 1, t_1 = -4 = 1 + b - 4 \rightarrow b = -1$$

$$c = \text{جواب} = -4, t_n = n^2 - n - 4$$

12

$$t_1 = 11 \rightarrow d = \frac{11 - 1}{1} = 10 \rightarrow t_n = 11n + 10$$

$$t_5 = 61$$

$$\rightarrow n^2 - n - 4 = 11n + 10 \rightarrow n^2 - 12n - 14 = 0 \rightarrow n^2 - 12n = 14 \rightarrow n(n - 12) = 14$$

$$\boxed{n = 14}$$