

11 سوال

کروہ (هم شخصه) (صن)

زبان قتی

① 1, 5, 12, 22, ... $tn = \frac{1}{2}n^2 + bn + c \rightarrow c = 0$ -1

$\xrightarrow{+1} \xrightarrow{+2} \xrightarrow{+3} \xrightarrow{+4}$ $tn = \frac{1}{2}n^2 + bn \rightarrow n = 2 \rightarrow 4 + 2b = 5$

$b = \frac{1}{2} \rightarrow tn = \frac{1}{2}n^2 - \frac{1}{2}n$

$t_{10} = \frac{1}{2}(10)^2 - \frac{1}{2}(10) = 150 - 5 = 145$

0, 1, 3, 6, ... $tn = \frac{n(n-1)}{2} = 55$ -2

$n(n-1) = 110 \rightarrow n = 11$

5, 12, 21, ... $tn = 11n - 3 \rightarrow t_{11} = 11 \cdot 11 - 3 = 115 - 3$

$\xrightarrow{+11} \xrightarrow{+11}$

5, 9, 13, ... $tn = 4n + 1 \rightarrow t_{11} = 4 \cdot 11 + 1 = 45$

$5 + 4 = 9$ $9 + 4 = 13$ $45 + 15 = 130$

$an = -1, \frac{1}{2}, -\frac{1}{3}, \frac{1}{4}, \dots$ -3

$\rightarrow$ $\frac{1}{n} - (-1) = \frac{1}{2}$ $\frac{1}{n} = \frac{1}{2} - (-1) = \frac{3}{2}$

$\rightarrow$ $\frac{1}{n} = \frac{3}{2} \rightarrow n = \frac{2}{3}$

$b_k = -27 - 21 = -48$ $a_k = -5k + 22$ $-5k + 22 = -48$ -4

$5k = 70 \rightarrow k = 14$

$t_{10} - t_4 = 12 \rightarrow 10a + b - (4a + b) = 12 \rightarrow 6a = 12 \rightarrow a = 2$ -5

$t_4 - t_1 = 9a + b - (a + b) = 5a = 10 \rightarrow a = 2$

نکته

$$a_n = a_{n+b} \quad \begin{cases} |a+b| = \sqrt{2} \\ |a+b| = 1 \end{cases} \quad \begin{aligned} a_1 = a+b = \sqrt{2} \\ a_2 = |a+b| = 1 \end{aligned} \quad -\checkmark$$

$$|a| = 1 \rightarrow a = \sqrt{2}, b = -1$$

$$b_n = 3, 11, 19, 27, \dots \rightarrow b_n = 8n - 5$$

$\xrightarrow{+8} \quad \xrightarrow{+8} \quad \xrightarrow{+8}$

$$t_n = \frac{1}{1}, \frac{1}{4}, \frac{1}{9}, \frac{1}{16}, \dots \rightarrow t_n = \frac{1}{n^2} \rightarrow \frac{1}{n^2} < \frac{1}{2} \quad -1$$

$\xrightarrow{+1} \quad \xrightarrow{+1} \quad \xrightarrow{+1} \quad \xrightarrow{+1}$

$$8n - 5 < 9n + 1 \rightarrow 8n < 13 \rightarrow n < \frac{13}{8} \approx 1.625$$

(حل به روش دیگر)

$$t_n = 9, 9, 9, 9, 0, \dots \rightarrow t_n = -\frac{1}{n} n^2 + bn + c \rightarrow t_n = -\frac{1}{n} n^2 + bn \quad -9$$

$\xrightarrow{+9} \quad \xrightarrow{+9} \quad \xrightarrow{+9} \quad \xrightarrow{+9}$

$\downarrow c=0$

$$t_1 = -\frac{1}{1} (1)^2 + b \cdot 1 = 9 \rightarrow 1 = 2b \Rightarrow b = \frac{1}{2}$$

$$t_n = -\frac{1}{n} n^2 + \frac{1}{2} n \rightarrow A + B = 2 \Rightarrow 1(-\frac{1}{n}) + \frac{1}{2}(1) = \frac{1}{2} \Rightarrow \frac{1}{2} = \frac{1}{2}$$

(حل به روش دیگر)

$$t_n = -\frac{1}{n}, -\frac{1}{n}, 0, \dots \Rightarrow t_n = n^2 + bn + c \rightarrow (2 - 9) b = -1 \quad -10$$

$\xrightarrow{+1} \quad \xrightarrow{+1}$

$$t_n = n^2 - n - 9 = 8n + 11$$

$$|a+b| = \sqrt{2}$$

$$|a+b| = 1$$

$$|a| = 0 \rightarrow a = 0, b = 1$$

$$n = 8n + 11$$

$$n^2 - 9n - 11 = 0 \rightarrow (n+3)(n-11) = 0$$

$$n = 9, -3$$

$\checkmark$