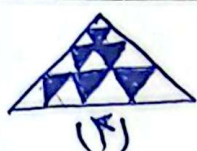


•  $\begin{matrix} \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \end{matrix} \rightarrow n^2$   $\begin{matrix} \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \end{matrix} \rightarrow n^2$   $\begin{matrix} \cdot & \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot & \cdot \end{matrix} \rightarrow n^2$

$\Rightarrow 0, 1, 3, 6, \dots \Rightarrow \dots \Rightarrow 1, 3, 6, \dots = \frac{n(n+1)}{2} \Rightarrow 0, 1, 3, 6, \dots = \frac{n(n-1)}{2}$

$\Rightarrow n^2 + \frac{n(n-1)}{2} \Rightarrow a_{10} = (10)^2 + \frac{10(10-1)}{2} = 100 + 45 = 145$



$0, 1, 3, 6, \dots \Rightarrow \dots \Rightarrow 0, 1, 3, 6, \dots \Rightarrow a_n = \frac{n(n-1)}{2}$

$\Rightarrow \frac{n(n-1)}{2} = 55 \Rightarrow n(n-1) = 110 \Rightarrow \boxed{n = 11}$

دریازدهمی

ساده‌های رنگی:  $\begin{cases} a_n = f(n+1) \Leftarrow 5, 9, 13, \dots \\ a_n = f(n-1) \Leftarrow 0, 4, 8, \dots \end{cases}$   $\leftarrow$  مجموع صدها  $a_n = 18n - 3$

$a_{11} = 18 \times 11 - 3 = 195$

$a_{11} = 4 \times 11 + 1 = 45$

$a_1 = \frac{(-1)^1}{1} = -1$  و  $a_2 = \frac{(-1)^2}{2} = \frac{1}{2}$  و  $a_3 = -\frac{1}{3}$  و  $a_4 = \frac{1}{4}$

کوچکترین  $\frac{1}{4}$  بزرگترین

$a_2 - a_1 = \frac{1}{2} - (-1) = \frac{1}{2} + 1 = \frac{3}{2} = 1\frac{1}{2} = 1\frac{1}{2}$

$b_3 = (-3)^3 - 1 \times 3 = -27 - 3 = -30$

$a_k = b_3 \Rightarrow -5k + 22 = -30 \Rightarrow -5k = -50 \Rightarrow k = 10$

$$a_{10} - a_1 = 12 \Rightarrow a_1 + 9d - a_1 - 9d = 12 \Rightarrow 12d = 12 \Rightarrow d = 1$$

$$a_9 - a_1 = ? \Rightarrow a_1 + 8d - a_1 = 8 \Rightarrow 8 = 8 \times 1 = \boxed{8}$$

$$a_7 = 15$$

$$a_7 = 15$$

$$a_1 = b_1 = 3$$

$$a_7 = b_7 = 11$$

$$b_n = ?$$

$$a_7 - a_1 = 15 - 3 \Rightarrow a_1 + 6d - a_1 - 0 = 12 \Rightarrow$$

$$6d = 12 \Rightarrow d = 2$$

$$a_7 = a_1 + 6d = 3 + 12 = 15 \Rightarrow a_1 + 6 = 15 \Rightarrow a_1 = 9$$

$$a_7 = a_1 + 6d = 3 + 12 = 15$$

$$\boxed{b_n = 11n - 8} \quad b_1 = 3, b_7 = b_1 + 6d = 11 \Rightarrow d = \frac{11 - 3}{6} = \frac{8}{6} = \frac{4}{3}$$

$$z_n = \frac{fn - r}{r + r} \Rightarrow \frac{fn - r}{r + r} < \frac{r}{r} \Rightarrow r(fn - r) < r(r + r)$$

$$11n - 8 < 4n + 4 \Rightarrow 7n < 12 \Rightarrow n < \frac{12}{7}$$

$$1, 2, 3, 4, 5, 6, 7 \leq n < 4 \Rightarrow n < 4 \Rightarrow n = 1, 2, 3$$

$$z_1 = 4, z_2 = 9, z_3 = 9, z_4 = 4 \Rightarrow z_1 = A(1)^r + B(1)^{-r} \Rightarrow A + B = 4$$

$$z_2 = A(2)^r + B(2)^{-r} = 9 \Rightarrow 2A + \frac{B}{2} = 9$$

$$-2B = -10 \Rightarrow B = \frac{10}{2} = 5$$

$$rA + \omega B \Rightarrow r\left(-\frac{r}{r}\right) + \omega\left(\frac{10}{r}\right) = \frac{-9}{r} + \frac{10\omega}{r} = \frac{4}{r} \Rightarrow A = -\frac{10}{r} = -\frac{5}{r}$$

$$z_n = an^r + bn + c \Rightarrow z_n = n^r + bn + c \Rightarrow z_1 = 1 + b + c = 4 \Rightarrow b + c = 3$$

$$a = \frac{d}{r} \Rightarrow d = r \Rightarrow a = 1$$

$$z_2 = 4 + 2b + c = 9 \Rightarrow 2b + c = 5$$

$$b = -1 \Rightarrow c = 4$$

$$z_n = n^r - n - 4$$

$$c = -4 + c = 4 \Rightarrow c = 8$$

$$a_7 = 15, a_7 = 15 \Rightarrow a_7 - a_1 = 15 - 3 = 12 = a_1 + 6d - a_1 - 0 \Rightarrow 6d = 12 \Rightarrow d = 2$$

$$a_n = \omega n + r \Rightarrow \omega n + r = n^r - n - 4 \Rightarrow n^r - 2n - 4 = 0 \Rightarrow (n-4)(n+1) = 0$$

$$\Rightarrow n = 4 \Rightarrow n = 4 \Rightarrow \boxed{n = 4} \Rightarrow \text{مطلوب}$$