

تعداد نقاطها: $\begin{matrix} +3 & +3 \\ +1 & +4 & +7 & +1 \\ \oplus & \oplus & \oplus & \oplus \end{matrix}$ $\Rightarrow a = \frac{3}{4}, c = 0 \Rightarrow 1 = \frac{3}{4}(1)^2 + b(1) + 0 \Rightarrow b = -\frac{1}{4} \Rightarrow a_n = \frac{3}{4}n^2 - \frac{1}{4}n \Rightarrow a_1 = \frac{3}{4}(\frac{1}{4}) - \frac{1}{4}(\frac{1}{4}) = \frac{2}{4} = \frac{1}{2}$

تعداد نقاط رنگی: $\begin{matrix} +3 & +3 \\ +0 & +1 & +2 & +3 \\ +1 & +1 & +1 \end{matrix}$ $\Rightarrow a = \frac{1}{4}, c = 0 \Rightarrow 0 = \frac{1}{4}(1)^2 + b(1) + 0 \Rightarrow b = -\frac{1}{4} \Rightarrow a_n = \frac{1}{4}n^2 - \frac{1}{4}n \Rightarrow a_1 = \frac{1}{4}(\frac{1}{4}) - \frac{1}{4}(\frac{1}{4}) = 0$

$a_n = n(n-1) \Rightarrow n=11$

$\left. \begin{matrix} \alpha_n = 4n+1 \\ \alpha_n = 4n-4 \end{matrix} \right\} \Rightarrow \left. \begin{matrix} \alpha_{11} = 4(11)+1 = 45 \\ \alpha_{11} = 4(11)-4 = 40 \end{matrix} \right\} \Rightarrow \text{کل مهره ها} = 45+40 = 85$

بزرگ ترین کوچک ترین $\alpha_n = \frac{(-1)^n}{n} = \left(-1, \frac{1}{2}, -\frac{1}{3}, \frac{1}{4}, \dots \right) \Rightarrow \frac{1}{4} - (-1) = \frac{5}{4}$

$b_n = (-3)^n - 1 \Rightarrow b_4 = (-3)^4 - 1 = 81 - 1 = 80$

$a_1 - a_4 = 12 \Rightarrow a_4 + 3d - a_1 = 12 \Rightarrow 3d = 12 \Rightarrow d = 4 \Rightarrow a_4 - a_1 = a_1 + 3d - a_1 = 3d = 12$

$\left. \begin{matrix} a_4 = 17 \\ a_4 = a_1 + 3d = 17 \end{matrix} \right\} \Rightarrow a_n = 4n-1 \Rightarrow a_4 = 4(4)-1 = 15 \Rightarrow \left. \begin{matrix} a_1 = 4(1)-1 = 3 \\ a_4 = 4(4)-1 = 15 \end{matrix} \right\} \Rightarrow b_n = 4n-5$

$\left. \begin{matrix} a_n = 4n-2 \\ a_n = 4n+3 \end{matrix} \right\} \Rightarrow c_n = \frac{4n-2}{4n+3} \Rightarrow \frac{4n-2}{4n+3} < \frac{3}{4} \Rightarrow 4n-2 < 3n+3 \Rightarrow n < 5 \Rightarrow n=4$

$\begin{matrix} +6 & +9 & +9 & +6 \\ +3 & +3 & +0 & +3 \\ -3 & -3 & -3 & -3 \end{matrix}$ $\Rightarrow a = -\frac{3}{4}, c = 0 \Rightarrow 6 = -\frac{3}{4}(1)^2 + b(1) + 0 \Rightarrow b = \frac{27}{4} \Rightarrow a_n = -\frac{3}{4}n^2 + \frac{27}{4}n \Rightarrow a_4 = -\frac{3}{4}(\frac{16}{4}) + \frac{27}{4}(\frac{16}{4}) = 21$

$\left. \begin{matrix} a_4 = 21 \\ a_4 = a_1 + 3d = 21 \end{matrix} \right\} \Rightarrow b_n = 4n+1$

$\left. \begin{matrix} a_1 = 1, c = -6 \Rightarrow -6 = 1(1)^2 + b(1) - 6 \Rightarrow b = -1 \Rightarrow a_n = n^2 - n - 6 \end{matrix} \right\} \Rightarrow \left. \begin{matrix} n(n-6) = 21 \Rightarrow n=9 \\ a_n = b_n = 4(9)+1 = 37 \end{matrix} \right\}$

