

$$1, 4+1, 9+2, 16, 4$$

$$t_n = n^2 + \frac{n(n-1)}{2} \Rightarrow t_{10} = 100 + \frac{10 \times 9}{2} = 145$$

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$$0, 1, 3, 4$$

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

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$$0, 4+1, 8+1, 12+1 \quad t_n = 4n+1$$

$$0, 4, 8 \quad t_n = 4(n-1)$$

$$4(11)+1 = 45 \quad \text{مهره های رنگی}$$

$$4(10) = 40 \quad \text{مهره های سفید}$$

$$40 + 45 + 4 = 130$$

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$$t_1 = \frac{-1}{1} = -1, \quad t_2 = \frac{-1}{2} = -\frac{1}{2} \dots$$

$$t_2 = \frac{1}{2}, \quad t_4 = \frac{1}{4} \dots$$

$$\frac{1}{2} - (-1) = 1\frac{1}{2} = 1.5$$

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$$b_3 = (-3)^3 - 7 \times 3 = -27 - 21 = -48$$

$$-48 = -5n + 22 \Rightarrow -70 = -5n \Rightarrow n = 14$$

$$k = 14$$

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$$t_n - t_m = (m-n)d \Rightarrow 12 = (10-8)d \Rightarrow d = 2$$

$$t_4 - t_1 = 0d = 0$$

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$$d_a = \frac{a_n - a_m}{n-m} = \frac{10-8}{4-2} = 1$$

$$a_1 = r - d = 8 - 1 = 7$$

$$a_r = r + d = 8 + 1 = 9$$

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$$d_b = \frac{b_n - b_m}{n-m} = \frac{11-7}{4-2} = 2$$

$$b_1 = 1 \times 1 + 2 = 3 \Rightarrow 2 = -0$$

$$b_n = 1n - 0$$

$$\frac{2}{0}, \frac{4}{1}, \frac{6}{2}, \frac{8}{3}, \frac{10}{4}, \frac{12}{5}, \frac{14}{6}, \frac{16}{7} \rightarrow \frac{2}{7}$$

$$\frac{r_n - 2}{r_n + 2} < \frac{r}{r} \Rightarrow 1n - 2 < 9n + 9 \Rightarrow 2n < 11 \quad n < 5/2$$

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$$\begin{array}{cccccc} 0, & 9, & 9, & 9, & 9, & 0 \\ \swarrow & \searrow & \swarrow & \searrow & \swarrow & \searrow \\ 0 & 9 & 9 & 9 & 9 & 0 \\ \swarrow & \searrow & \swarrow & \searrow & \swarrow & \searrow \\ 0 & 9 & 9 & 9 & 9 & 0 \end{array}$$

$$2a = -2 \Rightarrow a = -1/2$$

$$C = 0$$

$$A = a = -1/2$$

$$t_1 = -1/2 + B = 9 \Rightarrow B = 9 1/2$$

$$t_n = -1/2 n^2 + 9 1/2 n$$

$$2A + 0B = -1/2 + 2 \times 9 1/2 = 19$$

$$19$$

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$$\begin{array}{ccccccc} -9, & -9, & -9, & 0, & \dots & & \\ \swarrow & \searrow & \swarrow & \searrow & & & \\ 0 & -9 & -9 & 0 & & & \\ \swarrow & \searrow & \swarrow & \searrow & & & \\ 0 & -9 & -9 & 0 & & & \end{array}$$

$$C = -9$$

$$2a = r \Rightarrow a = 1$$

$$9 = 1 + b - 9 \Rightarrow b = -1$$

$$t_n = n^2 - n - 9$$

$$d = \frac{a_m - a_n}{m-n} = \frac{1-1}{1-1} = 0$$

$$a_r = 0 \times r + 21 = 21 \Rightarrow 21 = 21$$

$$a_n = 0n + 21$$

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$$0n + 21 = n^2 - n - 9 \Rightarrow n^2 - 9n - 27 = 0 \Rightarrow (n-9)(n+3) = 0 \Rightarrow n = 9 \text{ or } n = -3$$