

سوال ۱؟

$$1, 5, 12, 22, \dots \rightarrow \frac{1}{2}n^2 - \frac{1}{2}n \xrightarrow{n=11} \frac{1}{2} \cdot 121 - \frac{1}{2} \cdot 11 = 55$$

$$a = \frac{1}{2}, c = 0 \Rightarrow \frac{1}{2} + b = 1 \Rightarrow b = \frac{1}{2}$$

سوال ۲؟ $E_n = 55$ کشف شد

$$1, 3, 6, 10, \dots \rightarrow \frac{1}{2}n^2 - \frac{1}{2}n \xrightarrow{n=11} \frac{1}{2} \cdot 121 - \frac{1}{2} \cdot 11 = 55$$

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

$$a = \frac{1}{2}, c = 0 \Rightarrow \frac{1}{2} + b = 0 \Rightarrow b = -\frac{1}{2}$$

سوال ۳؟ مجموعه کل مرده ها، دوره های زنده در E_n مجموعه کل مرده ها 15 دوره های زنده 45

$$5, 9, 13, \dots \rightarrow E_n + 1 \xrightarrow{n=11} 55$$

$$5, 12, 21, \dots \rightarrow 11n - 4 \xrightarrow{n=11} 115$$

$$\begin{aligned} n=1 &\rightarrow 1 \\ n=2 &\rightarrow \frac{1}{2} \\ n=3 &\rightarrow -\frac{1}{2} \\ n=4 &\rightarrow 1 \\ n=5 &\rightarrow \frac{1}{2} \\ n=6 &\rightarrow -\frac{1}{2} \end{aligned}$$

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

$$-1 - \frac{1}{2} = -\frac{3}{2}$$

سوال ۴؟ $a_n = \frac{(-1)^n}{n}$ بزرگترین دو کوچکترین

$$b_k = ak, k=? \leftarrow a_n = -a_{n-1} + r, b_n = (-r)^n \cdot v_n$$

سوال ۵

$$b_n = (-r)^n \cdot v_n \xrightarrow{n=5} -25 - 21 = -46$$

$$a_n = -a_{n-1} + r = -25 \rightarrow -a_{n-1} + r = -25 \rightarrow n=12 \rightarrow k=14$$

$$E_4 - E_3 = ? \quad E_1 - E_0 = 12$$

$$a+b-4a-b = -3a = ? \quad 1+a+b-v-a-b = -v = 12 \Rightarrow a=12 \rightarrow a=12$$

$$a=12 \rightarrow a=12$$

سوال ۶؟ $a_1=5, a_2=15$

$$a_1 + a_2 + a_3 + \dots = 100 \Rightarrow 5 + 15 + \dots = 100$$

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سوال ۷؟ $E_n = \frac{1}{2}n^2 - \frac{1}{2}n$

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سوال 1

$$\frac{1}{4}A + \frac{1}{4}B = P, \quad t_n = An^2 + Bn, \quad t_n = 4, 9, 16, 25, \dots$$

$$\left(2 \times \frac{1}{4}\right) + \left(5 \times \frac{1}{4}\right)$$

$$-\frac{9}{4} + \frac{5n}{4} = \frac{44}{4} = 11$$

$$t_n = -\frac{9}{4}n^2 + \frac{10}{4}n$$

$$a = -\frac{9}{4}$$

$$c = 0$$

$$-\frac{9}{4} \dots b = 7$$

$$b = 7 - \frac{9}{4} \rightarrow b = \frac{19}{4}$$

سوال 2

44 - محمد مشرقي، $a_1 = 4, a_2 = 11$ ، $t_n = 4, 9, 16, 25, \dots$

$$t_n = n^2 - n - 4 \rightarrow n = 11 \rightarrow 44$$

$$a_n = a_1 + (n-1)d \rightarrow 44 = 4 + (n-1)d \rightarrow d = 11$$

$$a_2 = 4a + b + c$$

$$a_1 = 4a + b + c$$

$$4a = 1$$

$$a = \frac{1}{4}$$

$$a_n = \frac{1}{4}n + 11$$

$$4n + 11 = n^2 - n - 4$$

$$n^2 - 5n - 15 = 0$$

$$n(n-5) = 15 \rightarrow n = 9$$

$$n^2 - 4n - 15 = 0$$

$$(n-9)(n+5) = 0$$

$$n = 9$$