

$$\begin{matrix} 1^2 & 2^2 & 3^2 & 4^2 \\ (1) & (2) & (3) & (4) \end{matrix} \rightarrow a_n = n^2 + \frac{n(n-1)}{2} \rightarrow a_{10} = 10^2 + \frac{10 \times 9}{2} = 145$$

$$\begin{matrix} 0 & 1 & 3 \\ (1) & (2) & (3) \end{matrix} \rightarrow a_n = \frac{n(n-1)}{2} \rightarrow \frac{n(n-1)}{2} = 3 \rightarrow n(n-1) = 6 \rightarrow n = 3$$

$$1, 9, 25, \dots \rightarrow a_n = 4n+1 \rightarrow a_n = 4 \times 4 + 1 = 17$$

$$1, 13, 21, \dots \rightarrow a_n = 4n-3 \rightarrow a_{11} = 4 \times 11 - 3 = 41$$

$$a_1 = \frac{-1}{1} = -1, a_2 = \frac{1}{2}, a_3 = \frac{-1}{3}, a_4 = \frac{1}{4} \rightarrow \text{سری متناوب به ترتیب مثبت و منفی} \rightarrow \frac{1}{n} \rightarrow \sum_{n=1}^{\infty} \frac{1}{n} = \infty$$

$$b_r = (-3)^r - 7 \times r = -27 - 21 = -48 = a_{n+13} \rightarrow a_n = 13 \rightarrow n = 14$$

$$a_{10} - a_7 = 12 \rightarrow a + 9d - (a + 6d) = a + 9d - a - 6d = 3d = 12 \rightarrow d = 4$$

$$a_9 - a = a + 8d - a = 8d = 8 \times 4 = 32$$

$$a_r = 7, a_s = 16 \rightarrow d = \frac{16-7}{s-r} = \frac{9}{2-1} = 9 \rightarrow a_1 = 7 - 9 = -2$$

$$b_1 = 3, b_2 = 11 \rightarrow d = \frac{11-3}{2-1} = 8 \rightarrow 3, 11, 19, \dots \rightarrow a_n = 8n - 5$$

$$\frac{2}{5}, \frac{4}{7}, \frac{10}{9}, \frac{14}{11} \rightarrow \frac{tn-r}{rn+r} < \frac{5}{r} \rightarrow 11n-5 < 4n+9 \rightarrow 7n < 14 \rightarrow n < 2 \rightarrow n = 1$$

$$t_n^0 = 4, 9, 9, 4, 0 \rightarrow A = -\frac{5}{2} \rightarrow t_n = -\frac{5}{2}n^2 + Bn \rightarrow t_1 = -\frac{5}{2} + B = 4 \rightarrow B = \frac{13}{2}$$

$$\rightarrow B = \frac{13}{2} \rightarrow 5A + 4B = 5 \times (-\frac{5}{2}) + 4 \times (\frac{13}{2}) = -\frac{25}{2} + \frac{52}{2} = \frac{27}{2} = 13.5$$



$t_n = -4, -3, -2, \dots$ $a=1$ $c=-7 \rightarrow t_n = an^2 + bn + c = n^2 + bn - 7$ 16

$\begin{matrix} & +0 & +1 & +2 \\ \xrightarrow{+1} & \xrightarrow{+1} & \xrightarrow{+1} \\ \text{rk} & \text{rk} & \text{rk} \end{matrix}$
 $\rightarrow a_1 = 1 + b - 7 = -7 \rightarrow b = -1 \rightarrow t_n = n^2 - n - 7$

$a_1 = -7, a_2 = -5 \rightarrow \frac{a_2 - a_1}{2 - 1} = \frac{-5 - (-7)}{2 - 1} = \frac{2}{1} = 2 = d \rightarrow a_n = dn + r$

$\rightarrow n^2 - n - 7 = 2n + r \rightarrow n^2 - 3n - 7 = 0 \rightarrow (n-4)(n+1) = 0$ n=1
 $\rightarrow n = -1 \times$

$\rightarrow a_1 = 2(-1) + r = -7$