

الف) $t_n = 2n^2 - 1 \rightarrow$ ① ② ③ ④ ⑤
 $1, 11, 26, 47, 74$

ب) $t_n = \frac{2n+1}{n+3} \rightarrow$ ① ② ③ ④ ⑤
 $\frac{3}{8}, \frac{5}{6}, \frac{7}{1}, \frac{9}{8}, \frac{11}{9}$

الف) $t_n = \frac{(-1)^n}{\sqrt{n+3}} \rightarrow t_{13} = \frac{-1}{\sqrt{16}} = \boxed{-\frac{1}{4}}$

ب) $t_n = 2n - \left[\frac{n}{2}\right] \rightarrow t_{13} = 26 - \left[\frac{13}{2}\right] = \boxed{23}$
 $\frac{13}{2} = 6\frac{1}{2} = 6 \times 2$

الف) $2n - 1 < 0 \rightarrow 2n < 1 \rightarrow n < \frac{1}{2} \rightarrow 1 \leq n < 8 \Rightarrow$
 $8 - 1 = 7 \rightarrow$ جمله هفتم است

ب) $n^2 - 14n + 40 < 0 \rightarrow (n-4)(n-10) < 0 \begin{cases} n=4 \\ n=10 \end{cases}$
 $\frac{4}{+} \frac{10}{-} \Rightarrow 4 < n < 10 \rightarrow 5 \leq n \leq 9$
 5 جمله هفتم است $\rightarrow (9-5)+1 = 5$ تعداد جمله

الف) $2n - 14 \leq 0 \rightarrow 2n \leq 14 \rightarrow n \leq 7 \rightarrow 1 \leq n \leq 7$
 $(7-1)+1 = 7 \rightarrow$ جمله هفتم است

ب) $n^2 - 14n + 40 \leq 0 \rightarrow (n-4)(n-10) \leq 0 \begin{cases} n=4 \\ n=10 \end{cases} \Rightarrow \frac{4}{+} \frac{10}{-} \Rightarrow 4 \leq n \leq 10$
 $(10-4)+1 = 7 \rightarrow$ جمله هفتم است

$t_4 = 7 \quad t_9 = a + 4d \rightarrow \begin{cases} 7 = a + 4d \\ 22 = a + 8d \end{cases} \quad \begin{matrix} 9-4=5 \\ 22-7=15 \\ 15 \div 5 = 3 = d \end{matrix}$

$d = 3 \Rightarrow a = -2 \quad t_4 = a + 3d \Rightarrow -2 + 3(3) = \boxed{7}$

$$n^2 - 9n + 2$$

$$\min \rightarrow a > 0 \quad \text{معمولی: } n = -\frac{b}{2a} = \frac{9}{2}$$

$$a_1 = \frac{9^2 - 9(9) + 2}{2} = \boxed{-\frac{7}{2}}$$

$$n^2 + 4n + 1 \quad \min \rightarrow a > 0 \quad \text{معمولی: } n = -\frac{b}{2a} = -2$$

$$\frac{(-2)^2 + 4(-2) + 1}{2} = \boxed{-\frac{3}{2}}$$

$$+n = -\frac{9}{2}, -\frac{7}{2}, -1, -\frac{7}{2}, -\frac{9}{2}$$

$$\begin{matrix} \xrightarrow{+2} & \xrightarrow{+1} & \xrightarrow{+1} & \xrightarrow{+2} \\ \hline +2 & +1 & +1 & +2 \end{matrix} \rightarrow 2a = 2 \rightarrow a = 1$$

$$\begin{aligned} a_1 &= -\frac{9}{2} \\ a_2 &= -\frac{7}{2} \\ a_3 &= -1 \end{aligned} \Rightarrow \begin{cases} a_1 = 1(1) + b(1) + c = -\frac{9}{2} \\ a_2 = 1(2) + b(2) + c = -\frac{7}{2} \end{cases} \Rightarrow \begin{cases} -b - c = -\frac{9}{2} \\ 2b + c = -\frac{7}{2} \end{cases} \Rightarrow \begin{cases} b = -\frac{1}{2} \\ c = \frac{1}{2} \end{cases}$$

$$1(1) + 1(2) - 1(1) + \frac{1}{2} = -\frac{9}{2} + \frac{1}{2} = \boxed{-4}$$

$$+n = -\frac{9}{2}, -1, 1, \frac{1}{2}$$

$$\begin{matrix} \xrightarrow{+8} & \xrightarrow{+2} & \xrightarrow{+12} \\ \hline +8 & +2 & +12 \end{matrix}$$

$$a_n = an^2 + bn + c \Rightarrow \begin{cases} a_1 \Rightarrow a + b + c = -9 \\ a_2 \Rightarrow 4a + 2b + c = -1 \\ a_3 \Rightarrow 9a + 3b + c = 1 \end{cases}$$

$$\begin{aligned} (4a + 2b + c) - (a + b + c) &= -1 - (-9) \Rightarrow 3a + b = 8 \\ (9a + 3b + c) - (4a + 2b + c) &= 1 - (-1) \Rightarrow 5a + b = 2 \end{aligned}$$

$$2a = 8 \Rightarrow \boxed{a = 4}$$

$$3a + b = 8 \Rightarrow 3(4) + b = 8 \Rightarrow \boxed{b = -4} \quad a + b + c = -9 \Rightarrow \boxed{c = -5} \quad \boxed{a_n = 4n^2 - 4n - 5}$$

$$(-\infty, a+1], [2a+1, +\infty) \Rightarrow a+1 \geq 2a+1 \Rightarrow 1 \geq a$$

$$\boxed{a = 1 \rightarrow \text{فقط نقطه}}$$

$$\boxed{a < 1 \rightarrow \text{هیچ نقطه}}$$

$$a > 1 \rightarrow \text{نقطه}$$

$$\hookrightarrow [a+1, 2a+1] \rightarrow \text{بازه}$$

$$a_n = 99 \quad d = 3 \quad a_1 = 3$$

$$3, 6, 9, \dots \Rightarrow 3n = t_n \quad n = 33 \Rightarrow t_{33} = 99 \Rightarrow \text{نقطه}$$

$$a_n = 4 + (n-1) \cdot 2 \Rightarrow 99 = 4 + (n-1) \cdot 2$$

$$8, 10, 12, \dots \Rightarrow 8n = t_n \quad n = 19 \Rightarrow t_{19} = 92 \Rightarrow \text{نقطه}$$

$$a_n = 1 \dots d = 8 \quad a_1 = 1 \Rightarrow 1 = 1 + (n-1) \cdot 8 \Rightarrow n = 1 \Rightarrow \text{نقطه}$$

$$18, 20, 22, \dots \Rightarrow 18n = t_n \quad n = 5 \Rightarrow t_5 = 90 \Rightarrow \text{نقطه}$$

$$33 - 9 = 24 \rightarrow \text{تعداد اعداد زوج}$$

$$19 - 9 = 10 \rightarrow \text{تعداد اعداد زوج}$$

$$\text{فقط 8}$$