

الف) $t_n: 3n^2 - 1 \rightarrow n \geq 1 \rightarrow t_1: 3 \times (1)^2 - 1 = 2$
 $n \geq 2 \rightarrow t_2: 3 \times (2)^2 - 1 = 11 \rightarrow 2, 11, 20, 29, 38, \dots$
 $d = +9$

ب) $t_n: \frac{3n+1}{n+2} \rightarrow n \geq 1 \rightarrow t_1: \frac{3 \times 1 + 1}{1 + 2} = \frac{4}{3}$
 $n \geq 2 \rightarrow t_2: \frac{3 \times 2 + 1}{2 + 2} = \frac{7}{4}$
 $\rightarrow \frac{4}{3}, \frac{7}{4}, \frac{10}{5}, \frac{13}{6}, \frac{16}{7}, \dots$
 $d = +1$

الف) $t_n: \frac{(-1)^n}{\sqrt{n+3}} \rightarrow n \geq 1 \rightarrow t_1: \frac{(-1)^1}{\sqrt{1+3}} = \frac{-1}{2}$
 $t_2: \frac{(-1)^2}{\sqrt{2+3}} = \frac{1}{\sqrt{5}}$

ب) $t_n: 2n - \left[\frac{n}{2} \right] \rightarrow n \geq 1 \rightarrow t_1: 2 \times 1 - \left[\frac{1}{2} \right] = 2 - 0 = 2$
 $t_2: 2 \times 2 - \left[\frac{2}{2} \right] = 4 - 1 = 3$
 $t_3: 2 \times 3 - \left[\frac{3}{2} \right] = 6 - 1 = 5$
 $t_4: 2 \times 4 - \left[\frac{4}{2} \right] = 8 - 2 = 6$
 $t_5: 2 \times 5 - \left[\frac{5}{2} \right] = 10 - 2 = 8$
 $t_6: 2 \times 6 - \left[\frac{6}{2} \right] = 12 - 3 = 9$
 $t_7: 2 \times 7 - \left[\frac{7}{2} \right] = 14 - 3 = 11$
 $t_8: 2 \times 8 - \left[\frac{8}{2} \right] = 16 - 4 = 12$
 $t_9: 2 \times 9 - \left[\frac{9}{2} \right] = 18 - 4 = 14$
 $t_{10}: 2 \times 10 - \left[\frac{10}{2} \right] = 20 - 5 = 15$

الف) $t_n: 2n - 1 \rightarrow 2n - 1 < 0 \rightarrow 2n < 1 \rightarrow n < \frac{1}{2} \Rightarrow n \geq 1, 2, 3, 4 \rightarrow (1, 2, 3, 4)$

ب) $t_n: n^2 - 15n + 56 \rightarrow n^2 - 15n + 56 < 0 \rightarrow (n-7)(n-8) < 0 \rightarrow \frac{+}{-} \frac{-}{+} \frac{+}{-} \Rightarrow n \geq 5, 6, 7, 8, 9 \rightarrow (5, 6, 7, 8, 9)$

الف) $t_n: 2n - 14 \rightarrow 2n - 14 \leq 0 \rightarrow 2n \leq 14 \rightarrow n \leq 7 \Rightarrow n \geq 1, 2, 3, 4, 5, 6, 7 \rightarrow (1, 2, 3, 4, 5, 6, 7)$

ب) $t_n: n^2 - 12n + 27 \rightarrow n^2 - 12n + 27 \leq 0 \rightarrow (n-3)(n-9) \leq 0 \rightarrow \frac{+}{-} \frac{-}{+} \frac{+}{-} \Rightarrow n \geq 3, 4, 5, 6, 7, 8, 9 \rightarrow (3, 4, 5, 6, 7, 8, 9)$

$t_4 = 5$
 $t_9 = 22$
 $t_3 = ?$
 $d = \frac{t_2 - t_1}{2 - 1} = \frac{22 - 5}{1} = 17$
 $t_3 = t_2 - d = 22 - 17 = 5$

الف) $t_n: n^2 - 4n + 2 \rightarrow$ باید به فرم $an^2 + bn + c$ باشد $\rightarrow n = \frac{-b}{2a} = \frac{4}{2} = 2 \rightarrow t_2 = 2^2 - 4 \times 2 + 2 = -6$

ب) $t_n: n^2 + 4n + 1 \rightarrow$ به فرم $an^2 + bn + c$ باشد $\rightarrow n = \frac{-b}{2a} = \frac{-4}{2} = -2 \rightarrow$ ترتیب $n = 1, 2, 3, \dots$ $\rightarrow t_{(1)} = 1^2 + 4(1) + 1 = 6$

$t_n: -3, -7, -11, -15, -19, \dots$
 $d = -4$
 $t_1 = 1, t_2 = 1 - 4 = -3, t_3 = 1 - 8 = -7, t_4 = 1 - 12 = -11, t_5 = 1 - 16 = -15, t_6 = 1 - 20 = -19, \dots$
 $t_n = n^2 - 4n + 1$

$$t_n: -9, -1, 7, 21, \dots$$

$$\begin{array}{ccc} +5 & +9 & +13 \\ \downarrow & \downarrow & \downarrow \\ +4 & +4 & \end{array}$$

$$\rightarrow t_n: an^2 + bn + c \rightarrow a = \frac{14}{2} = 7, c = -9 - 1 = -10 \rightarrow t_n: 7n^2 + bn - 10$$

$$\frac{\text{اختلاف، امتدادها}}{2} \quad \text{حل، مشتق (نقطه)}$$

$$t_1: 7(1)^2 + b(1) - 10 = -9$$

$$7 + b - 10 = -9 \rightarrow b = -1$$

$$t_n: 7n^2 - n - 10$$

$$\leftarrow b = -1$$

$$\text{اشتراک} \Rightarrow \text{مقادیر} = \text{نقطه} \rightarrow \text{اشتراک} = \text{نقطه} \rightarrow a + 14, 2a + 1 \rightarrow (a, 3)$$

$$\text{الف) } \left[\frac{100}{3} \right] = 33 \rightarrow (33)$$

$$\text{ج) } \left[\frac{100}{15} \right] = 6 \rightarrow (6)$$

$$\text{ب) } \left[\frac{100}{5} \right] = 20 \rightarrow (20)$$

$$\text{د) } 33 + 20 - 6 = 47 \rightarrow (47)$$