

الف) $t_n = 3n^2 - 1 \xrightarrow{\text{جدول اول}} \begin{matrix} 2 & 11 & 24 & 47 & 74 \\ 9 & 15 & 21 & 27 \end{matrix} \checkmark$

ب) $\frac{r_{n+1}}{n+4} = \frac{3}{5} \text{ و } \frac{5}{6} \text{ و } \frac{7}{7} \text{ و } \frac{9}{8} \text{ و } \frac{11}{9} \checkmark \text{ (۲)}$

الف) $t_n = \frac{(-1)^n}{\sqrt{n+3}} \xrightarrow{\text{جدول اول}} \frac{(-1)^{13}}{\sqrt{13+3}} = \frac{-1}{\sqrt{16}} = \frac{-1}{4} \checkmark$

ب) $t_n = 2n - \left[\frac{n}{4}\right] \xrightarrow{\text{جدول اول}} \begin{matrix} 2 & 13 \\ 24 \end{matrix} - \left[\frac{13}{4}\right] = \begin{matrix} 23 \\ 3 \end{matrix} \checkmark \text{ (۲)}$

الف) $t_n = 2n - 10 \Rightarrow 2n - 10 < 0 \Rightarrow 2n < 10 \Rightarrow n < 5 \rightarrow n = 1, 2, 3, 4 \rightarrow \text{جدول ۴} \checkmark \text{ (۲)}$

ب) $t_n = n^2 - 14n + 40 \Rightarrow n^2 - 14n + 40 < 0 \Rightarrow (n-4)(n-10) < 0 \rightarrow \text{ریشه ها} = 4 \text{ و } 10$
 $\frac{4}{+} \quad \frac{10}{+} \Rightarrow \text{جدول ۵} \checkmark$

الف) $t_n = 2n - 16 \Rightarrow 2n - 16 \leq 0 \Rightarrow 2n \leq 16 \Rightarrow n \leq 8 \rightarrow n = 1, 2, 3, 4, 5, 6, 7, 8 \rightarrow \text{جدول ۸} \checkmark \text{ (۲)}$

ب) $t_n = n^2 - 12n + 27 \Rightarrow n^2 - 12n + 27 \leq 0 \Rightarrow (n-3)(n-9) \leq 0 \rightarrow \text{ریشه ها} = 3 \text{ و } 9$
 $\frac{3}{+} \quad \frac{9}{+} \Rightarrow \text{جدول ۷} \checkmark$

$\left. \begin{matrix} t_4 = 7 \\ t_9 = 22 \end{matrix} \right\} \rightarrow t_9 = t_4 + 5d \rightarrow 22 = 7 + 5d \rightarrow d = 3 \rightarrow t_3 = t_4 - d \rightarrow 7 - 3 = 4 \checkmark \text{ (۲)}$

الف) $\{n = n^r - 9n + 1\} \xrightarrow{a) \circ} n = \frac{-b}{r_a} \rightarrow \frac{9}{r} = 3 \rightarrow a_p = 3 \rightarrow 3^r - 9r + 1 = -1$ (2)

ب) $\{n = n^r + \varepsilon n + 1\} \xrightarrow{a) \circ} n = \frac{-b}{r_a} = \frac{-\varepsilon}{r} = -2 \xrightarrow{\text{عدد طبيعي كثره}} 1 + \varepsilon + 1 = 9_{min}$ (2)

$\{n = -\frac{\varepsilon}{r} - 1, -\frac{\varepsilon}{r} - 1, -\frac{\varepsilon}{r} - 1, -\frac{\varepsilon}{r} - 1, -\frac{\varepsilon}{r} - 1\} \rightarrow \{n = an^r + bn + c\}$

$a_1 = -\varepsilon \rightarrow 1 \times 1^r + b + c = -\varepsilon \rightarrow 1 + b + c = -\varepsilon \rightarrow -b - c = \varepsilon$

$a_r = -1 \rightarrow 1 \times r^r + r b + c = -1 \rightarrow \varepsilon + 2b + c = -1 \rightarrow 2b + c = -1 - \varepsilon$
 $\left. \begin{array}{l} -b - c = \varepsilon \\ 2b + c = -1 - \varepsilon \end{array} \right\} \rightarrow b = -\frac{\varepsilon}{3}, c = 1$
 $\{n = 100 - \frac{\varepsilon}{3} + 1 = \frac{\varepsilon}{3}\}$ (2)

$\{n = -9, -1, 1, 2, \dots\} \rightarrow \{n = an^r + bn + c\} \rightarrow r a_1 = \varepsilon \rightarrow a = 3$

$a_1 = -9 \rightarrow 3 \times (1^r) + b + c = -9 \rightarrow b + c = -12$
 $a_r = -1 \rightarrow 3 \times (r^r) + r b + c = -1 \rightarrow 3r^r + r b + c = -1$
 $\left. \begin{array}{l} b + c = -12 \\ 3r^r + r b + c = -1 \end{array} \right\} \rightarrow b = -19, c = -1$
 $\{a_n = 3n^r - 19n - 1\}$ (2)

$(-\infty, a + \varepsilon]$ و $[2a + 1, +\infty)$

$a + 3 = 2a + 1 \rightarrow \varepsilon - 1 = a \rightarrow a = 2$

١١ اشتدال یک عصر

١٥ (2) $\rightarrow 57, 3$

$a + 2 \leftarrow 2a + 1 \rightarrow a + 2$ (1)

١٢ اشتدال نهائیه با شنه

الف) $\frac{3}{r}, \frac{9}{r}, \frac{12}{r}, \dots, 99 \rightarrow \text{مجموعه} = 3n \rightarrow 3n = 99 \rightarrow n = 33$ (2)

ب) $\frac{5}{r}, \frac{10}{r}, \frac{15}{r}, \dots, 100 \rightarrow \text{مجموعه} = 5n \rightarrow 5n = 100 \rightarrow n = 20$ (2)

ج) $\frac{1}{r}, \frac{2}{r}, \frac{4}{r}, \dots, 90 \rightarrow \text{مجموعه} = 15n \rightarrow 15n = 90 \rightarrow n = 6$ (2)

د) $33 + 20 = 53 - 6 = 47$ (2)