

الف) $3(1)^2 - 1 = 2$, $3(2)^2 - 1 = 11$, $3(3)^2 - 1 = 26$, $3(4)^2 - 1 = 47$, $3(5)^2 - 1 = 74$

ب) $\frac{3}{5}$, $\frac{8}{7}$, $\frac{15}{11}$, $\frac{24}{13}$, $\frac{35}{17}$

الف) $\frac{(-1)^{13}}{\sqrt{13+3}} = \frac{-1}{\sqrt{14}} = -\frac{1}{\sqrt{14}}$

ب) $2(13) - \left[\frac{13}{4} \right]_{\left[\frac{13}{4} \right]} = 26 - 3 = 23$

الف) $2n - 10 < 0$, $2n < 10$, $n < 5 \Rightarrow 1 \leq n < 5 \Rightarrow \boxed{4}$

ب) $(n-10)(n-4) < 0 \Rightarrow$ ریشه ها = 4 و 10

$\frac{4}{+} - \frac{10}{+}$

$4 < n < 10$

$n = 5, 6, 7, 8, 9 \Rightarrow \boxed{5}$

الف) $2n - 14 \leq 0 \Rightarrow 2n \leq 14 \Rightarrow n \leq 7 \Rightarrow 1 \leq n \leq 7 \Rightarrow \boxed{7}$

ب) $(n-3)(n-9) \Rightarrow$ ریشه ها = 3 و 9 $\Rightarrow 3 \leq n \leq 9 \Rightarrow \boxed{7}$

$\frac{3}{+} - \frac{9}{+}$

$d \begin{cases} t_r \\ v = t_r \\ \omega d = 10 \\ d = 3 \\ r_r = t_r \end{cases}$

$t_r = v - r = \boxed{4}$

$$\text{الف) } a > 0 \Rightarrow n = \frac{-b}{2a} = \frac{4}{2} = 2$$

$$n = 2 \Rightarrow n^2 - 4n + 2 = 4 - 8 + 2 = \boxed{-2}$$

①

ب) $n^2 + 4n + 1 = 0 \Rightarrow n = \frac{-b}{2a} = \frac{-4}{2} = -2$ $\times \rightarrow$ از یک شروع می شود

$$n = -2 \Rightarrow n^2 + 4n + 1 = 4 + (-8) + 1 = \boxed{-3}$$

$$t_1 = 4$$

$$t_n = -4, -7, -1, -7, -4$$

$$\begin{matrix} & \nwarrow & \nearrow & \nwarrow & \nearrow \\ -2 & -1 & 1 & 2 \\ & \nwarrow & \nearrow & \nwarrow & \nearrow \\ & +2 & +2 & +2 \end{matrix}$$

$$2a = 2 \Rightarrow a = 1$$

$$\begin{cases} a_1 = -4 \\ a_2 = -7 \end{cases} \Rightarrow \begin{cases} a_1 = 1(1)^2 + b(1) + c = -4 \\ a_2 = 1(2)^2 + b(2) + c = -7 \end{cases}$$

$$\begin{cases} 2b + c = -11 \\ b + c = -9 \end{cases} \Rightarrow \begin{cases} b = -2 \\ c = 1 \end{cases}$$

$$f(n) = an^2 + bn + c = n^2 - 4n + 1 = (10)^2 - 40 + 1 = \boxed{41}$$

②

$$-4, -1, 1, 2$$

$$\begin{matrix} & \nwarrow & \nearrow & \nwarrow & \nearrow \\ +5 & +9 & +13 \\ & \nwarrow & \nearrow & \nwarrow & \nearrow \\ & +4 & +4 \end{matrix}$$

$$2a = 4$$

$$a = 2$$

$$f(n) = an^2 + bn + c$$

$$\begin{cases} t_1 = -4 \\ t_2 = -1 \end{cases} \Rightarrow \begin{cases} 2(1)^2 + b(1) + c = -4 \\ 2(2)^2 + b(2) + c = -1 \end{cases}$$

$$\begin{cases} 2b + c = -9 \\ b + c = -9 \end{cases} \Rightarrow \begin{cases} b = 0 \\ c = -9 \end{cases}$$

$$f(n) = 2n^2 - n - 9$$

③

$$A = [2a+1, +\infty)$$

$$B = (-\infty, a+4]$$

$$A \cap B = [2a+1, a+4]$$

|| برای متناهی بودن

$$2a+1 \geq a+4$$

$$\boxed{a \geq 3}$$

④

الف) از 3 تا 99 $\frac{99-3}{2} + 1 = \boxed{48}$

$$\Rightarrow 33 + 19 - 4 = \boxed{48}$$

①

ب) از 5 تا 95 $\frac{95-5}{2} + 1 = \boxed{45}$

$$\rightarrow \beta = \left[\frac{1}{\frac{1}{5}} \right] = 5$$

ج) از 10 تا 90 $\frac{90-10}{10} + 1 = \boxed{9}$

$$n(A \cup B) = n(A) + n(B) - n(A \cap B) = 48 + 45 - 9 = 84$$