

15 (الف) $t_1 = 3, t_2 = 11, t_3 = 26, t_4 = 49, t_5 = 84, \dots$

$t_n = 2, 11, 24, 49, 84, \dots$

(ب) $t_1 = \frac{4+1}{1+4} = \frac{5}{5} = 1, t_2 = \frac{5+1}{1+5} = \frac{6}{6} = 1, t_3 = \frac{6+1}{1+6} = \frac{7}{7} = 1, t_4 = \frac{7+1}{1+7} = \frac{8}{8} = 1, t_5 = \frac{8+1}{1+8} = \frac{9}{9} = 1$

$t_n = \frac{5}{5}, \frac{6}{6}, \frac{7}{7}, \frac{8}{8}, \frac{9}{9}, \dots$

20 (الف) $t_{13} = \frac{(-1)^{13}}{\sqrt{13+3}} = \frac{-1}{4}$ (ب) $t_{13} = 2 \times 13 - \left[\frac{13}{4} \right] = 24 - 3 = 21$

(الف) $2n - 10 < 0 \rightarrow n < 5$ (جواب منقول است)

(ب) $n^2 - 14n + 40 < 0 \rightarrow (n-10)(n-4) < 0$ (جواب منقول است) $\frac{10}{10-4} \rightarrow n = 5, 6, 7, 8, 9$

25 (الف) $2n - 16 < 0 \rightarrow n < 8$ (جواب منقول است)

(ب) $n^2 - 14n + 40 < 0 \rightarrow (n-10)(n-4) < 0$ (جواب منقول است) $\frac{10}{10-4} \rightarrow n = 5, 6, 7, 8, 9$

(الف) $t_n = an + b \rightarrow \begin{cases} 5a + b = 1 \\ 9a + b = 17 \end{cases}$

$4a = 16 \rightarrow a = 4, b = -19$

$\rightarrow t_n = 4n - 19$

$t_4 = 4 \times 4 - 19 = -3$

الف) $n_{\min} = \frac{-b}{2a} = \frac{4}{2} = 2$ $t_{\min} = 9 - 18 + 2 = -7$ (4)

ب) $n_{\min} = \frac{-4}{2} = -2$ $t_1 = 1 + 4 + 1 = 6$ (5)

$t_n = -4, -1, 2, 5, 8$
 $\begin{matrix} -4 & -1 & 2 & 5 & 8 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ -4 & -1 & 2 & 5 & 8 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ -4 & -1 & 2 & 5 & 8 \end{matrix}$

$t_n = an^2 + bn + c$

$a = \frac{4}{2} = 2$, $C = \text{پنجم جمله} \Rightarrow C = -4 \Rightarrow C = -4$

$n=1 \rightarrow a+b+C = -4 \rightarrow 2+b-4 = -4 \rightarrow b = -2$

$t_n = n^2 - 4n + 1 \rightarrow t_{1, 2, 3, 4, 5} = 1, -2, 3, 8, 15$

$t_n = -4, -1, 2, 5, 8$
 $\begin{matrix} -4 & -1 & 2 & 5 & 8 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ -4 & -1 & 2 & 5 & 8 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ -4 & -1 & 2 & 5 & 8 \end{matrix}$

$t_n = an^2 + bn + c$

$a = \frac{4}{2} = 2$, $C = \text{پنجم جمله} \Rightarrow C = -4 \Rightarrow C = -4$

$n=1 \rightarrow a+b+C = -4 \rightarrow 2+b-4 = -4 \rightarrow b = -2$

$t_n = 2n^2 - 4n - 4$

$a \leq x \leq a+1 \rightarrow x \leq a \rightarrow a = [x, +\infty)$ (9)

$2, 4, 6, \dots, 99 \rightarrow a_n = 2n \rightarrow 2n \leq 99 \rightarrow n \leq 49.5 \rightarrow [\frac{100}{2}] = 49$ (10)

$10, 15, 20, \dots, 100 \rightarrow a_n = 5n \rightarrow 5n \leq 100 \rightarrow n \leq 20 \rightarrow [\frac{100}{5}] = 20$ (11)

$15, 20, 25, \dots, 90 \rightarrow a_n = 5n \rightarrow 5n \leq 90 \rightarrow n \leq 18 \rightarrow [\frac{90}{5}] = 18$ (12)

A و B اعداد غیر منفرد

$n(A \cup B) = n(A) + n(B) - n(A \cap B) = 23 + 20 - 9 = 34$ (13)