

(الف) $n=1 \rightarrow 3 \times 1 - 1 = 2$ $n=3 \rightarrow 3 \times 9 - 1 = 26$ (۱)

$n=2 \rightarrow 3 \times 4 - 1 = 11$ $n=4 \rightarrow 3 \times 16 - 1 = 47$

$n=5 \rightarrow 3 \times 25 - 1 = 74$ $2, 11, 26, 47, 74$ (۲)

ب) $\frac{3}{5}, \frac{5}{6}, \frac{7}{7}, \frac{9}{8}, \frac{11}{9}$ ✓

(الف) $t_{13} = \frac{(-1)^{13}}{\sqrt{13+3}} = \frac{-1}{\sqrt{16}} = \frac{-1}{4}$ (ب) $t_{13} = 2 \times 13 - \left[\frac{13}{4} \right] = 23$ (۲)

(الف) $2n-10 < 0$ $2n < 10$ $n < 5$ $1 < n < 4$ $(4-1)+1 = 4$ ✓ (۳)

(ب) $(n-10)(n-4) < 0$ $\frac{10}{+} \frac{4}{-}$ $4 < n < 10$ $5 \leq n \leq 9$ $(9-5)+1 = 5$ ✓

(الف) $2n-14 \leq 0$ $2n \leq 14$ $n \leq 7$ $1 < n \leq 7$ $(7-1)+1 = 7$ ✓ (۴)

(ب) $(n-3)(n-9) \leq 0$ $\frac{3}{+} \frac{9}{-}$ $[3, 9]$ ✓

$t_4 = 7 \rightarrow a(4) + b = 7$ $\begin{cases} 4a + b = 7 \\ -4a - b = 7 \end{cases}$ $8a = 0$ $a = 0$ $b = 7$ (۵)
 $t_9 = 22 \rightarrow a(9) + b = 22$ $\begin{cases} 9a + b = 22 \\ 9a + b = 22 \end{cases}$ $a = 3, b = -5$ (۲)
 $t_n = 3n - 5$ $t_3 = 3 \times 3 - 5 = 4$ ✓

(الف) $n = \frac{-b}{2a} \rightarrow \frac{-(-4)}{2} = 2$ $a_2 = 3 - 4 \times 2 + 2 = -7$ (۶)

ب) $h = \frac{-b}{2a} = \frac{-4}{2} = -2$ $a_2 = (-2)^2 + 4x - 2 + 1 = -3$ $n=1 \rightarrow t_1 = 4$ $n=2 \rightarrow t_2 = 13$ $\rightarrow t_{\min} = 4$ (۷)

$t_n = -n^2 - 7n - 1, -7, -1, -7, -1, \dots$ $2a = 2 \rightarrow a = 1$ $\begin{cases} a_1 = -1 \rightarrow 1(1)^2 + b(1) + c = -7 \\ a_2 = -7 \rightarrow 1(2)^2 + b(2) + c = -7 \end{cases}$ $-b - c = 0 \rightarrow b = -4, c = 1$ $a_n = n^2 - 4n + 1$ $a_{10} = 10^2 - 4 \times 10 + 1 = 61$ ✓

$$t_n = -4, -1, 1, 4, \dots$$

$\underbrace{-4}_{+0} \quad \underbrace{-1}_{+9} \quad \underbrace{1}_{+13}$
 $\quad \quad \quad +8 \quad +4$

$$an^2 + bn + c$$

(1)

$$a + b + c = -4 \rightarrow c = -4 - a - b$$

$$4a + 2b - 4 - a - b = -1$$

(2)

~~or~~

$$\begin{cases} 1a + 2b = 14 \\ 3a + b = 0 \end{cases}$$

$$9a + 3b - 4 - a - b = -1$$

$$\rightarrow 2a = 8, a = 4, b = -12, c = -16$$

$$t_n = 2n^2 - n - 16$$



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

(3)

(4)

الف) 3, 6, 9, ..., 99 $a_n = a_1 + (n-1)d \rightarrow 99 = 3 + (n-1) \times 3$

$$3(n-1) = 96 \quad (n-1) = 32$$

$$n = 33$$

ب) 2, 10, 18, ..., 98 $a_n = a_1 + (n-1)d \rightarrow 98 = 2 + (n-1) \times 8$

$$n-1 = 12, n = 13$$

ج) 15, 20, 25, 30, 35, 40 $\rightarrow 61 \quad \frac{40 - 15}{15} + 1 = 61$

د) اصل شمول $\rightarrow n(A \cup B) = n(A) + n(B) - n(A \cap B)$

a ← بخش نهمین
b ← بخش نهمین

$$33 + 19 - 9 = 43$$

