

الف) $2n^2 - 1$

$$\begin{array}{ccccccc} 2 & 11 & 26 & 47 & 74 & 107 & 146 \\ \hline 9 & 15 & 21 & 27 & & & \\ \hline 6 & 6 & 6 & & & & \end{array}$$

ب) $\frac{2n+1}{n+4}$ $\frac{3}{5}, \frac{5}{6}, \frac{7}{7}=1, \frac{9}{8}, \frac{11}{9}$

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

ب) $2n - \left\lfloor \frac{n}{4} \right\rfloor = 26 - \left\lfloor \frac{13}{4} \right\rfloor = 26 - \left\lfloor 3 \frac{1}{4} \right\rfloor = 26 - 3 = 23$

الف) $2n - 1$

$2n - 1 < 0 \quad 2n < 1 \quad n < \frac{1}{2}$ $n = \{ \frac{1}{2}, 0, -\frac{1}{2}, -1, -\frac{3}{2}, -2, \dots \}$

ب) $n^2 - 14n + 48 \rightarrow (n-10)(n-4) < 0$

$\frac{4}{+} \quad \frac{10}{-}$ $n = \{ 5, 6, 7, 8, 9 \}$

$t_n = 2n - 16$

$2n - 16 < 0 \quad 2n < 16 \quad n < 8 \quad n = \{ 1, 2, 3, 4, 5, 6, 7 \}$

$t_n = n^2 - 12n + 27 \rightarrow (n-3)(n-9) < 0$

$\frac{3}{+} \quad \frac{9}{-}$ $(9-3)+1 = 7 \rightarrow n = \{ 4, 5, 6, 7, 8 \}$

$t_n = 3n^2 - 5$

$t_3 = 3(3)^2 - 5 = 29$

$t_9 = 9a + b = 22$

$-9a - b = -22$

$\Rightarrow a = 3, b = -5$

الف) $n^2 - 9n + 2$ $n = \frac{-b}{2a} = \frac{9}{2} = 4.5$ $a_3 = 9 - 11 + 2 = -1$ min

ب) $n^2 + 4n + 1$ $n = \frac{-b}{2a} = \frac{-4}{2} = -2$ $a_1 = 1 + 4 + 1 = 6$

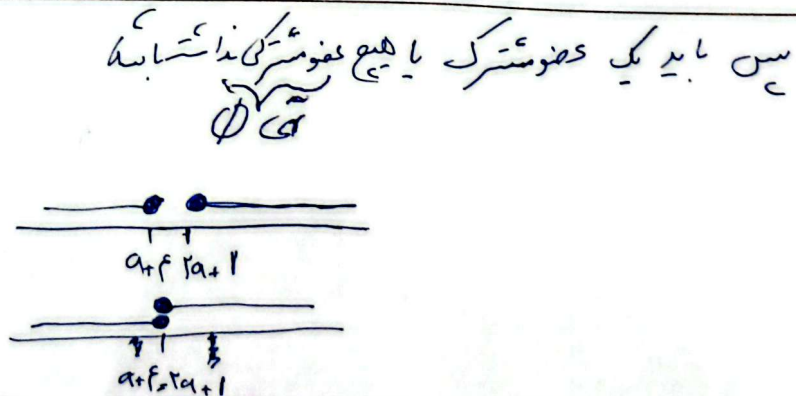
$t_n = -4, -1, 1, 4$
 $-a, -3, -1, 1, 2$
 $2, 2, 2, 2$
 $\Rightarrow$ $2a = 4 \Rightarrow a = 2$

$t_n = an^2 + bn + c$ $t_{10} = 100 - 90 + 1 = 11$
 $c = 1$
 $t_n = n^2 - 9n + 1$
 $t_1 = 1 + b + 1 = -4 \Rightarrow b = -6$

$t_n = -6, -1, 1, 4$
 $-7, -5, -3, -1, 1, 3$
 $4, 4, 4$

$an^2 + bn + c$
 $a = 2$ $c = -7$
 $t_n = 2n^2 + bn - 7$
 $t_1 = 2 + b - 7 = -6 \Rightarrow b = -1$
 $t_n = 2n^2 - n - 7$

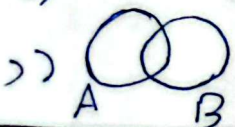
$a + 4 < 2a + 1$
 $2 < a$
 $a \in (2, \infty)$



الف) $A = \{3, 6, 9, 12, \dots, 99\}$

ب) $B = \{5, 10, 15, \dots, 90\}$

ج) $A \cap B = \{15, 30, 45, \dots, 90\}$



$(A \cup B) = (A \cap B) \cup (A \setminus B) \cup (B \setminus A)$

$(A \cup B) = 15 + 19 + 9 = 43$

$\frac{99-3}{3} + 1 = 33$
 $\frac{90-5}{5} + 1 = 19$
 $\frac{90-15}{15} + 1 = 6$

$n(A \cup B) = n(A) + n(B) - n(A \cap B)$
 $43 = 33 + 19 - 9$