

الف) $t_n = 3n^2 - 1 \Rightarrow t_1 = 3(1)^2 - 1 = 2 \quad t_2 = 3(2)^2 - 1 = 11$
 $t_3 = 3(3)^2 - 1 = 22 \quad t_4 = 3(4)^2 - 1 = 47$
 $t_5 = 3(5)^2 - 1 = 74$

ب) $t_n = \frac{2n+1}{n+2} \Rightarrow t_1 = \frac{2(1)+1}{1+2} = \frac{3}{3} = 1$
 $t_2 = \frac{2(2)+1}{2+2} = \frac{5}{4}$
 $t_3 = \frac{2(3)+1}{3+2} = \frac{7}{5}$
 $t_4 = \frac{2(4)+1}{4+2} = \frac{9}{6} = \frac{3}{2}$
 $t_5 = \frac{2(5)+1}{5+2} = \frac{11}{7}$

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

ب) $t_n = 2n - \left\lfloor \frac{n}{2} \right\rfloor \Rightarrow t_{13} = 2(13) - \left\lfloor \frac{13}{2} \right\rfloor = 26 - 6 = 20$

الف) $t_n = 2n - 10 \Rightarrow 2n - 10 < 0 \Rightarrow 2n < 10 \Rightarrow n < 5 \Rightarrow 1 \leq n < 5$

ب) $t_n = n^2 - 12n + 20 \Rightarrow n^2 - 12n + 20 < 0 \Rightarrow (n-10)(n-2) < 0$
 $2 < n < 10$

الف) $t_n = 2n - 14 \Rightarrow 2n - 14 \leq 0 \Rightarrow 2n \leq 14 \Rightarrow n \leq 7 \Rightarrow 1 \leq n \leq 7$

ب) $t_n = n^2 - 12n + 20 \Rightarrow n^2 - 12n + 20 \leq 0 \Rightarrow (n-10)(n-2) \leq 0$
 $2 \leq n \leq 10$

$t_2 = 11$
 $t_4 = 47$
 $t_6 = 74$
 $t_8 = 119$
 $t_{10} = 174$
 $t_{12} = 239$
 $t_{14} = 314$
 $t_{16} = 399$
 $t_{18} = 494$
 $t_{20} = 599$
 $t_{22} = 714$
 $t_{24} = 839$
 $t_{26} = 974$
 $t_{28} = 1119$
 $t_{30} = 1274$
 $t_{32} = 1439$
 $t_{34} = 1614$
 $t_{36} = 1799$
 $t_{38} = 1994$
 $t_{40} = 2199$
 $t_{42} = 2414$
 $t_{44} = 2639$
 $t_{46} = 2874$
 $t_{48} = 3119$
 $t_{50} = 3374$
 $t_{52} = 3639$
 $t_{54} = 3914$
 $t_{56} = 4199$
 $t_{58} = 4494$
 $t_{60} = 4799$
 $t_{62} = 5114$
 $t_{64} = 5439$
 $t_{66} = 5774$
 $t_{68} = 6119$
 $t_{70} = 6474$
 $t_{72} = 6839$
 $t_{74} = 7214$
 $t_{76} = 7599$
 $t_{78} = 7994$
 $t_{80} = 8399$
 $t_{82} = 8814$
 $t_{84} = 9239$
 $t_{86} = 9674$
 $t_{88} = 10119$
 $t_{90} = 10574$
 $t_{92} = 11039$
 $t_{94} = 11514$
 $t_{96} = 12009$
 $t_{98} = 12514$
 $t_{100} = 13039$

الف) $t_n = n^2 - 4n + 4 \Rightarrow n = \frac{-b}{2a} = \frac{-(-4)}{2(1)} = 2 \rightarrow t_2 = 4 - 8 + 4 = 0$ ~~$t_2 = -4$~~
 $a > 0$
 $n = 2$
 $t_2 = -4$ ① جمله ی مربع دنیان

ب) $t_n = n^2 + 8n + 1 \Rightarrow n = \frac{-b}{2a} = -1 \rightarrow t_1 = 1 + 8 + 1 = 10$
 $a > 0$
جمله ی مربع دنیان

$t_n = -8, -1, 1, 4, 9, \dots$
 $t_n = an^2 + bn + c \rightarrow t_n = n^2 - 4n + 1$
 $t_1 = 1(1)^2 + b(1) + c = -8$
 $t_2 = 1(2)^2 + b(2) + c = -1$ ⑤
 $\begin{cases} 4b + c = -11 \\ -b - c = 9 \end{cases}$
 $b = -2, c = +1$
 $t_{10} = 100 - 40 + 1 = 61$
 $t_{10} = 61$

$t_n = -4, -1, 1, 4, 9, \dots$
 $t_n = an^2 + bn + c \rightarrow t_n = 2n^2 - n - 4$
 $t_1 = 2(1)^2 + b(1) + c = -4$ ⑤
 $t_2 = 2(2)^2 + b(2) + c = -1$
 $\begin{cases} 4b + c = -9 \\ -b - c = +1 \end{cases}$
 $b = -1, c = -4$

$(-\infty, a + \epsilon] \cap [2a + 1, +\infty) = [2a + 1, a + \epsilon]$ ①
 چون سوال گفته
 متناهی پس
 $a = 3$ ~~$a = 3$~~
 $2a + 1 \leq a + \epsilon \rightarrow a \leq 3 \rightarrow \checkmark$ استرانه متناهی
 $a + \epsilon \leq 2a + 1 \rightarrow 3 \leq a \rightarrow \times$ استرانه متناهی
 این شرط درسته!

الف) $3, 4, 9, \dots, 99$ $t_1 = 3, t_n = 99$ $d = 3$ $t_n = 3 + (n-1)3 = 99$ $n = 33$ $3n = 99$ $t_{33} = 99$	ب) $1, 10, 15, \dots, 100$ $t_1 = 100, t_n = 100$ $d = 5$ $an = 100$ $t_n = 5 + (n-1)5 = 100$ $n = 20$ $t_{20} = 100$	ج) $1, 5, 9, \dots, 90$ $t_1 = 15, t_n = 90$ $d = 15$ $15n = 90$ $n = 6$ $t_6 = 90$	د) $n(3 \cup 5)$ $= n(3) + n(5)$ $= n(15)$ $n = 45$
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