

الف) $t_n = 3n^2 - 1$ $n=1 \Rightarrow 2$ $n=2 \Rightarrow 11$
 $n=3 \Rightarrow 24$ $n=4 \Rightarrow 47$ $n=5 \Rightarrow 74$

$2, 11, 24, 47, 74$

ب) $t_n = 2n + 1$ $n=1 \Rightarrow 3$ $n=2 \Rightarrow 5$ $n=3 \Rightarrow 7$ $n=4 \Rightarrow 9$ $n=5 \Rightarrow 11$
 $3, 5, 7, 9, 11$

الف) $t_n = \frac{(-1)^n}{\sqrt{n+2}}$ $= \frac{(-1)^{13}}{\sqrt{14}} = \boxed{\frac{-1}{\sqrt{14}}}$

ب) $t_n = 2n - \left[\frac{n}{2}\right] = 24 - \left[\frac{13}{2}\right] = 24 - 6 = 18$

الف) $t_n = 2n - 10$ $2n - 10 < 0 \Rightarrow n < 5$
 $\Rightarrow 1, 2, 3, 4$
 جمله‌های منفی.

ب) $t_n = n^2 - 14n + 4$ $n^2 - 14n + 4 < 0$
 $(n-4)(n-10) < 0$
 $n \in (4, 10)$
 $\Rightarrow 5, 6, 7, 8, 9$
 جمله‌های منفی است.

الف) $t_n = 2n - 14$ $2n - 14 < 0 \Rightarrow n < 7$
 $1, 2, 3, 4, 5, 6$
 جمله‌های منفی.

ب) $t_n = n^2 - 12n + 27$ $n^2 - 12n + 27 < 0$
 $(n-3)(n-9) < 0$
 $n \in (3, 9)$
 $4, 5, 6, 7, 8$
 جمله‌های منفی.

ج) $t_9 = t_1 + 1d$, $t_8 = t_1 + 3d \Rightarrow t_9 - t_8 = d = 10$
 $\Rightarrow d = 3$
 د) $t_9 = 22$, $t_8 = 7$ دنباله خطی
 $t_9 - t_8 = d$
 $\Rightarrow 22 - 7 = 15$

الف) $t_n = n^2 - 4n + 2$ $n^2 - 4n + 2 < 0$
 $(n-2)(n-2) < 0 \Rightarrow n = 2$
 ب) $y_{min} = -\frac{\Delta}{2a} = -\frac{-4}{2} = 2$

ب) $t_n = n^2 + 4n + 1$ $n^2 + 4n + 1 < 0$
 $\Delta = 16 - 4 = 12$
 $n = \frac{-4 \pm \sqrt{12}}{2} = -2 \pm \sqrt{3}$
 $n \in (-2 - \sqrt{3}, -2 + \sqrt{3})$
 از این تبدیل به $n = -2$ می‌رسیم که قابل قبول است.

الف) $a + b + c = -4$ $a + b + c = -4$
 $2 + b + c = -4 \Rightarrow b + c = -6$
 $\Rightarrow n^2 - 4n + 1$
 $n = 1 \Rightarrow 1 - 4 + 1 = -2$

ب) $t_n = -4n - 7$ $-4n - 7 < 0$
 $-4n < 7 \Rightarrow n > -1.75$
 $n = 0 \Rightarrow t_0 = -7$
 $n = 1 \Rightarrow t_1 = -11$
 $n = 2 \Rightarrow t_2 = -15$
 $n = 3 \Rightarrow t_3 = -19$
 $n = 4 \Rightarrow t_4 = -23$
 $n = 5 \Rightarrow t_5 = -27$
 $n = 6 \Rightarrow t_6 = -31$
 $n = 7 \Rightarrow t_7 = -35$
 $n = 8 \Rightarrow t_8 = -39$
 $n = 9 \Rightarrow t_9 = -43$
 $n = 10 \Rightarrow t_{10} = -47$
 $n = 11 \Rightarrow t_{11} = -51$
 $n = 12 \Rightarrow t_{12} = -55$
 $n = 13 \Rightarrow t_{13} = -59$
 $n = 14 \Rightarrow t_{14} = -63$
 $n = 15 \Rightarrow t_{15} = -67$
 $n = 16 \Rightarrow t_{16} = -71$
 $n = 17 \Rightarrow t_{17} = -75$
 $n = 18 \Rightarrow t_{18} = -79$
 $n = 19 \Rightarrow t_{19} = -83$
 $n = 20 \Rightarrow t_{20} = -87$
 $n = 21 \Rightarrow t_{21} = -91$
 $n = 22 \Rightarrow t_{22} = -95$
 $n = 23 \Rightarrow t_{23} = -99$
 $n = 24 \Rightarrow t_{24} = -103$
 $n = 25 \Rightarrow t_{25} = -107$
 $n = 26 \Rightarrow t_{26} = -111$
 $n = 27 \Rightarrow t_{27} = -115$
 $n = 28 \Rightarrow t_{28} = -119$
 $n = 29 \Rightarrow t_{29} = -123$
 $n = 30 \Rightarrow t_{30} = -127$
 $n = 31 \Rightarrow t_{31} = -131$
 $n = 32 \Rightarrow t_{32} = -135$
 $n = 33 \Rightarrow t_{33} = -139$
 $n = 34 \Rightarrow t_{34} = -143$
 $n = 35 \Rightarrow t_{35} = -147$
 $n = 36 \Rightarrow t_{36} = -151$
 $n = 37 \Rightarrow t_{37} = -155$
 $n = 38 \Rightarrow t_{38} = -159$
 $n = 39 \Rightarrow t_{39} = -163$
 $n = 40 \Rightarrow t_{40} = -167$
 $n = 41 \Rightarrow t_{41} = -171$
 $n = 42 \Rightarrow t_{42} = -175$
 $n = 43 \Rightarrow t_{43} = -179$
 $n = 44 \Rightarrow t_{44} = -183$
 $n = 45 \Rightarrow t_{45} = -187$
 $n = 46 \Rightarrow t_{46} = -191$
 $n = 47 \Rightarrow t_{47} = -195$
 $n = 48 \Rightarrow t_{48} = -199$
 $n = 49 \Rightarrow t_{49} = -203$
 $n = 50 \Rightarrow t_{50} = -207$
 $n = 51 \Rightarrow t_{51} = -211$
 $n = 52 \Rightarrow t_{52} = -215$
 $n = 53 \Rightarrow t_{53} = -219$
 $n = 54 \Rightarrow t_{54} = -223$
 $n = 55 \Rightarrow t_{55} = -227$
 $n = 56 \Rightarrow t_{56} = -231$
 $n = 57 \Rightarrow t_{57} = -235$
 $n = 58 \Rightarrow t_{58} = -239$
 $n = 59 \Rightarrow t_{59} = -243$
 $n = 60 \Rightarrow t_{60} = -247$
 $n = 61 \Rightarrow t_{61} = -251$
 $n = 62 \Rightarrow t_{62} = -255$
 $n = 63 \Rightarrow t_{63} = -259$
 $n = 64 \Rightarrow t_{64} = -263$
 $n = 65 \Rightarrow t_{65} = -267$
 $n = 66 \Rightarrow t_{66} = -271$
 $n = 67 \Rightarrow t_{67} = -275$
 $n = 68 \Rightarrow t_{68} = -279$
 $n = 69 \Rightarrow t_{69} = -283$
 $n = 70 \Rightarrow t_{70} = -287$
 $n = 71 \Rightarrow t_{71} = -291$
 $n = 72 \Rightarrow t_{72} = -295$
 $n = 73 \Rightarrow t_{73} = -299$
 $n = 74 \Rightarrow t_{74} = -303$
 $n = 75 \Rightarrow t_{75} = -307$
 $n = 76 \Rightarrow t_{76} = -311$
 $n = 77 \Rightarrow t_{77} = -315$
 $n = 78 \Rightarrow t_{78} = -319$
 $n = 79 \Rightarrow t_{79} = -323$
 $n = 80 \Rightarrow t_{80} = -327$
 $n = 81 \Rightarrow t_{81} = -331$
 $n = 82 \Rightarrow t_{82} = -335$
 $n = 83 \Rightarrow t_{83} = -339$
 $n = 84 \Rightarrow t_{84} = -343$
 $n = 85 \Rightarrow t_{85} = -347$
 $n = 86 \Rightarrow t_{86} = -351$
 $n = 87 \Rightarrow t_{87} = -355$
 $n = 88 \Rightarrow t_{88} = -359$
 $n = 89 \Rightarrow t_{89} = -363$
 $n = 90 \Rightarrow t_{90} = -367$
 $n = 91 \Rightarrow t_{91} = -371$
 $n = 92 \Rightarrow t_{92} = -375$
 $n = 93 \Rightarrow t_{93} = -379$
 $n = 94 \Rightarrow t_{94} = -383$
 $n = 95 \Rightarrow t_{95} = -387$
 $n = 96 \Rightarrow t_{96} = -391$
 $n = 97 \Rightarrow t_{97} = -395$
 $n = 98 \Rightarrow t_{98} = -399$
 $n = 99 \Rightarrow t_{99} = -403$
 $n = 100 \Rightarrow t_{100} = -407$

$2a = 4 \Rightarrow a = 2$

$n = 0 \Rightarrow t_0 = c = -7$

$n = 1 \Rightarrow a + b + c = -4$

$-a + b = -4 \Rightarrow b = -1$

$2n^2 - 1n - 7 = 2n^2 - n - 7$

۹) اگر اشتراک دو بازه‌ی $(-\infty, a+4]$ و $[2a+1, +\infty)$ متناهی باشد و a ؟

$$\left\{ \begin{array}{l} \text{---} \leftarrow a+4 \quad 2a+1 \rightarrow \text{---} \\ \text{---} \leftarrow 2a+1 \quad a+4 \rightarrow \text{---} \end{array} \right\} \Rightarrow a+4 < 2a+1$$

$$3 < a$$

$$[3, +\infty)$$

۱۰) ۱۰۰ پند تا ۱۰۰ در نظر بگیرید:

الف) چند عدد به ۳ بخش پذیر؟ $\frac{99-3}{3} + 1 = \boxed{33}$ $3, \dots, 99$

ب) عدد به ۵ بخش پذیر؟ $\frac{95-5}{5} + 1 = \boxed{19}$ $5, \dots, 95$

ج) چند عدد به ۳ و ۵ بخش پذیر؟ $\frac{45-15}{15} + 1 = \boxed{4}$ $15, \dots, 45$

د) چند عدد به ۳ یا ۵ بخش پذیر؟
 اشتراک $3 \times 5 = 15$
 مجموع $\frac{45-15}{15} + 1 = 4$

$$3 = 33$$

$$5 = 19$$

$$\text{اشتراک } 3, 5 = 4$$

$$\Rightarrow \text{مجموع } 3 \text{ یا } 5 = 19 + 33 - 4 = \boxed{48}$$

$$n(A \cup B) = n(A) + n(B) - n(A \cap B)$$