

الف) $t_n = 3n^2 - 1$ $n=1 \rightarrow t_1 = 2, n=2 \rightarrow t_2 = 11$ ✓
 $n=3 \rightarrow t_3 = 24, n=4 \rightarrow t_4 = 47, n=5 \rightarrow t_5 = 74$ ✓

$$= \frac{3n + 1}{n+4} = \frac{3(n+4) - 1}{n+4} = \frac{3(n+4) - 1}{n+4} = 3 - \frac{1}{n+4}$$

 ب) $t_n = \frac{n+1}{n+4}$ $n=1 \rightarrow t_1 = \frac{2}{5}, n=2 \rightarrow t_2 = \frac{3}{6} = \frac{1}{2}, n=3 \rightarrow t_3 = \frac{4}{7}, n=4 \rightarrow t_4 = \frac{5}{8}, n=5 \rightarrow t_5 = \frac{6}{9} = \frac{2}{3}$ ✓

الف) $t_n = \frac{(-1)^n}{\sqrt{n+3}}$ $\rightarrow \frac{(-1)^{13}}{\sqrt{13+3}} = \frac{-1}{\sqrt{16}} = \frac{-1}{4} = -\frac{1}{4} \times \frac{\sqrt{14}}{\sqrt{14}} = -\frac{\sqrt{14}}{14}$ ✓

ب) $t_n = 2n - \left[\frac{n}{4}\right] \rightarrow t_{13} = 2(13) - \left[\frac{13}{4}\right] = 26 - 3 = 23$ ✓

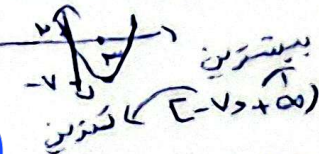
الف) $t_n = 2n - 10$ $2n - 10 < 0$
 $2n < 10$
 $n < 5 \rightarrow n \in \mathbb{N} \rightarrow n = \{1, 2, 3, 4\}$ ✓
 ب) $t_n = n^2 - 14n + 40$ $n^2 - 14n + 40 < 0$
 $(n-10)(n-4) < 0$ $\rightarrow n \in (4, 10)$ $\rightarrow n = \{5, 6, 7, 8, 9\}$ ✓

الف) $t_n = 2n - 14$ $2n - 14 \leq 0$
 $2n \leq 14$
 $n \leq 7$ $\rightarrow$ مجبوراً $n = 7$ $\rightarrow$ کبیسی از ۱ تا ۷ ✓
 ب) $t_n = n^2 - 12n + 27$ $(n-2)(n-9)$ $\rightarrow [2, 9]$ ✓
 مجبوراً $n = 2$ یا $n = 9$

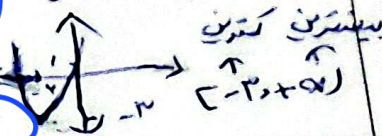
$t_8 = 7, t_9 = 22$
 $t_{10} = 1, t_{11} = t_8 - d$
 $t_8 + t_{11} - d = 7 - 2 = 5$ ✓
 $t_9 = t_8 + d \rightarrow 22 = 7 + d \Rightarrow d = 15$

الف) $tn = n^2 - 4n + 2$ $\min \left(\frac{-b}{2a} = \frac{4}{2} = 2 \right)$
 $(2)^2 - 4(2) + 2 = -2$

← n باید شروع می شود



ب) $tn = n^2 + fn + 1$ $\min \left(\frac{-b}{2a} = \frac{-f}{2} = -2 \right)$
 $(-2)^2 + f(-2) + 1 = -1$



$tn = n^2 - 4n + 2$
 $(-2)^2 - 4(-2) + 2 = 10$

$2d = f \Rightarrow d = 1$
 $c = -1$
 $dn = n^2 + bn + 1$

$d_1 = 1^2 + b + 1 = 2 + b = -f$
 $\Rightarrow b = -4$
 $\Rightarrow dn = n^2 - 4n + 1$

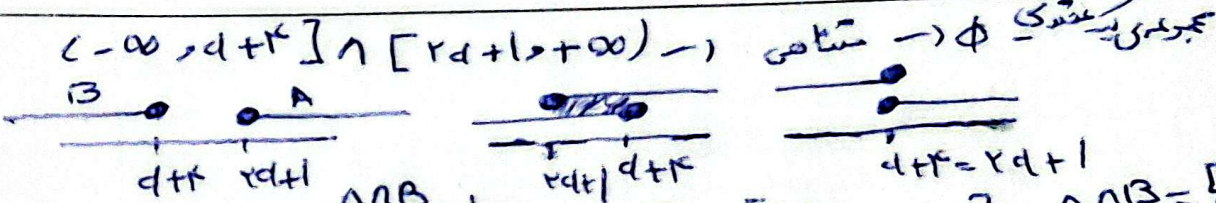
$tn = n^2 - 4n + 2$
 $(-2)^2 - 4(-2) + 2 = 10$

$2d = f \Rightarrow d = 2$
 $c = -2$

$dn = 2n^2 + bn - 2$

$d_1 = 2 \times 1^2 + b - 2 = -2 + b$
 $= -4 \Rightarrow b = -2$

$dn = 2n^2 - 2n - 2$



$2d + 1 \geq d + f$
 $d \geq 2$

$A \cap B = \emptyset$

$A \cap B = [2d + 1, d + f]$

$A \cap B = \{2d + 1, d + f\}$

$3, 4, 9, \dots, 99$ $dn = 3n$ $\frac{99-3}{3} + 1 = 33$ $n(A)$

$5, 10, 15, \dots, 95$ $dn = 5n$ $\frac{95-5}{5} + 1 = 19$ $n(B)$

$15, 30, 45, \dots, 90$ $dn = (5 \times 3)n = 15n$ $\frac{90-15}{15} + 1 = 6$ $n(C)$

$n(A \cup B) = n(A) + n(B) - n(A \cap B) = 33 + 19 - 6 = 46$