

الف) $t_n = 3n^2 - 1 \Rightarrow 2, 11, 26, 49, 76$

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

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

ب) $t_n = 2n - \left\lfloor \frac{n}{5} \right\rfloor \Rightarrow 2 \times 12 - \left\lfloor \frac{12}{5} \right\rfloor \Rightarrow 24 - 2 = \boxed{22}$

الف) $t_n = 2n - 10 \Rightarrow -10, -8, -6, -4, -2, 0, 2, \dots$

ب) $t_n = n^2 - 14n + 40$
 $n=9 \Rightarrow 81 - 126 + 40 = -5$
 $n=1 \Rightarrow 1 - 14 + 40 = 27$
 $n=7 \Rightarrow 49 - 98 + 40 = -9$

الف) $t_n = 2n - 16 \Rightarrow -14, -12, -10, -8, -6, -4, -2, 0$

ب) $n^2 - 12n + 27 \Rightarrow n=9$ (فقط برای $n=9$ صدق کند)

$d = \frac{t_m - t_s}{m - n} \Rightarrow \frac{12 - 5}{9 - 4} \Rightarrow \frac{7}{5} = \boxed{\frac{7}{5}}$

$t_n = t_1 + (n-1)d$
 $7 = t_1 + 9$
 $t_1 = -2$
 $t_n = -2 + (n-1) \times \frac{7}{5}$
 $t_3 = -2 + 6 = \boxed{4}$

الف) $t_n = n^2 - 9n + 2 \rightarrow n=1 \Rightarrow 1 - 9 + 2 = -6$ $n=2 \Rightarrow 4 - 18 + 2 = -12$
 $n=3 \Rightarrow 9 - 27 + 2 = -16$ $n=4 \Rightarrow 16 - 36 + 2 = -20$
 $n=5 \Rightarrow 25 - 45 + 2 = -18$ $n=6 \Rightarrow 36 - 54 + 2 = -16$
 $n=7 \Rightarrow 49 - 63 + 2 = -12$ $n=8 \Rightarrow 64 - 72 + 2 = -6$
 $n=9 \Rightarrow 81 - 81 + 2 = 2$

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ب) $t_n = n^2 + 1n + 1 \rightarrow n=1 \Rightarrow 1 + 1 + 1 = 3$ $n=2 \Rightarrow 4 + 2 + 1 = 7$
 $n=3 \Rightarrow 9 + 3 + 1 = 13$

$t_n = -6 - 12 - 18 - 20 - 18 - 12 - 6$
 $t_1 = 1 + b + c = -6$
 $t_2 = 4 + 2b + c = -12$
 $t_3 = 9 + 3b + c = -18$
 $\frac{t_2 - t_1}{t_3 - t_2} = \frac{b}{b} = 1$
 $b = -6$
 $t_1 = 1 - 6 + c = -6 \Rightarrow c = -1$
 $t_n = n^2 - 6n - 1$
 $100 - 60 - 1 = 39$

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$t_n = -6 - 12 - 18 - 20 - 18 - 12 - 6$
 $a_1 = 1 + b + c$
 $b_1 = 2a + b \Rightarrow 2 \times 1 + b = -6 \Rightarrow b = -8$
 $c_1 = 2a = 2 \Rightarrow a = 1$
 $2 - 1 + c = -6 \Rightarrow c = -7$
 $t_n = 2n^2 - 8n - 7$

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برای اینکه اشتراک بین متناهی جویبار با ۵۴ با ۲۵۵ مساوی باشد

$2a+1 = a+4$
 $a = 3$
 $2a+1 > a+4$
 $a > 3$
 $(-\infty, 3] \cap (3, +\infty) = \{3\}$
 $\text{اشترک نداشته باشند (تفکیک)}$
 $1, 2 \rightarrow a > 3$

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$99 \leq 3 \Rightarrow \frac{99-3}{3} + 1 = 33$ الف) ۳۳ عدد ✓
 $100 \leq 0 \Rightarrow \frac{100-0}{0} + 1 = 20$ ب) ۲۰ عدد ✓
 $90 \leq 10 \Rightarrow \frac{90-10}{10} + 1 = 9$ ج) ۹ عدد ✓
 $n(A \cup B) = n(A) + n(B) - n(A \cap B) \Rightarrow 23 + 20 - 6 = 37$

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