

تکانه ۱۰

۱۸/۵

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۱) $t_n = 3n^2 - 1$ عمرگذاری $t_1 = 3 \times 1 - 1 = 2$, $t_2 = 3 \times 4 - 1 = 11$, $t_3 = 3 \times 9 - 1 = 26$, $t_4 = 3 \times 16 - 1 = 47$, $t_5 = 3 \times 25 - 1 = 74$ ✓

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

جواب: $\frac{3}{2}, \frac{5}{4}, \frac{7}{5}, \frac{9}{6}, \frac{11}{7}$ ✓ (۲)

۲) $t_n = \frac{(-1)^n}{\sqrt{n+2}}$ $\rightarrow (-1)^1 = -1$ $\rightarrow \frac{-1}{\sqrt{4}} = -\frac{1}{2}$ ✓

ب) $t_n = 2n - \left\lfloor \frac{n}{2} \right\rfloor = 26 - \left\lfloor \frac{13}{2} \right\rfloor = 26 - 6 = 20$ ✓ (۲)

۳) $t_n = 2n - 1$ عمرگذاری $2(n-1) < 0 \rightarrow -2n + 2 < 0 \rightarrow 2 < 2n \rightarrow n > 1$ ✓

ب) $t_n = n^2 - 12n + 40 \rightarrow (n-6)(n-10)$ $\rightarrow \frac{+}{-} \frac{-}{+} \frac{+}{-}$ $\rightarrow$ جواب: ۶ و ۱۰ ✓ (۲)

۴) $t_n = 2n - 12 \rightarrow 2(n-6) < 0 \rightarrow -2n + 12 < 0 \rightarrow 12 < 2n \rightarrow n > 6$ ✓

ب) $t_n = n^2 - 12n + 27 \rightarrow (n-3)(n-9)$ $\rightarrow \frac{+}{-} \frac{-}{+} \frac{+}{-}$ $\rightarrow$ جواب: ۳ و ۹ ✓ (۲)

$t_8 = 8a + b = 7$ $\rightarrow 72 - 7 = 65 = 5a \rightarrow a = 13$ $\rightarrow 8 \times 13 + b = 7 \rightarrow b = -97$

$t_9 = 9a + b = 22$ $\rightarrow 9 \times 13 + b = 22 \rightarrow b = -97$

$t_{13} = (3 \times 13) - 97 = 39 - 97 = -58$ ✓ (۲)

۵) $t_n = n^2 - 4n + 2$ عمرگذاری $a > 0 \rightarrow \frac{-b}{2a} = \frac{-(-4)}{2} = 2$ ✓

$t_3 = 3^2 - 4 \times 3 + 2 = 9 - 12 + 2 = -1$ ✓ (۱)

ب) $t_n = n^2 + 8n + 1 \rightarrow a > 0 \rightarrow n = \frac{-b}{2a} = \frac{-8}{2} = -4$ ✗

$t_{-2} = 8 - 16 + 1 = -7$ $t_1 = 9$

n از این شروع می‌شود

$t_n = 1 - \{ 9 - V, -19 - V, -\{ 9, \dots \}$ $a_2 = 2 \rightarrow a_2 = 1$ (✓)
 $\begin{matrix} \xrightarrow{-\omega} & \xrightarrow{-\omega} & \xrightarrow{-\omega} & \xrightarrow{-\omega} & \xrightarrow{-\omega} \\ \xrightarrow{-\omega} & \xrightarrow{-\omega} & \xrightarrow{-\omega} & \xrightarrow{-\omega} & \xrightarrow{-\omega} \end{matrix}$
 $\begin{matrix} -\omega & -\omega & -\omega & -\omega & -\omega \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ 2 & 2 & 2 & 2 & 2 \end{matrix}$ $a_1 + a_{n+1} = -\varepsilon$
 $t_{10} = 100(-9 \times 10) + 1 \rightarrow 100 - 90 + 1 = 11 \rightarrow 1 + b + 12 = -\varepsilon \rightarrow b = -\varepsilon$ (✓)

$t_n = \begin{pmatrix} -V \end{pmatrix} - \{ 9, -19, 21, \dots \}$ $a_2 = 2 \rightarrow a_2 = 2$ (1)
 $\begin{matrix} \xrightarrow{+1} & \xrightarrow{+4} & \xrightarrow{+9} & \xrightarrow{+13} \\ \xrightarrow{+1} & \xrightarrow{+4} & \xrightarrow{+9} & \xrightarrow{+13} \end{matrix}$
 $\begin{matrix} \xrightarrow{+1} & \xrightarrow{+4} & \xrightarrow{+9} & \xrightarrow{+13} \\ \downarrow & \downarrow & \downarrow & \downarrow \\ \varepsilon & \varepsilon & \varepsilon & \varepsilon \end{matrix}$ $C_2 = -V$
 $t_n = 2n^2 + bn - V \rightarrow 6 + b - V = -9 \rightarrow b = -1$
 $\text{جواب} = t_n = 2n^2 - n - V$ (✓)

$a + \varepsilon < a + 1 \rightarrow r \leq a$ (✓) (9)
 یا باید دو عدد با هم برابر باشند یا هیچ استرانی
 $\leftarrow a + \varepsilon < a + 1$ یا نه پس باید

$a_1 = 3, a_n = 99 \rightarrow d = 2 \rightarrow t_n = a_1 + (n-1)d \rightarrow 99 = 3 + (n-1)2 \rightarrow n = 49$ (✓) (10)

$a_1 = 5, a_r = 95 \rightarrow d = 2 \rightarrow t_n = a_1 + (n-1)d \rightarrow 95 = 5 + (n-1)2 \rightarrow n = 49$ (✓)
 $B = \left[\frac{100}{\omega} \right] = 2$

ع. $\{ r \in (r, a) \} = 15$ $a_1 = 15, a_r = 25 \rightarrow d = 10 \rightarrow t_n = a_1 + (n-1)d \rightarrow 25 = 15 + (n-1)10 \rightarrow n = 2$ (✓)

$n(r \cup a) \rightarrow n(r) + n(a) - n(r \cap a) \rightarrow 33 + 19 - 6 = 46$ (✓)