

نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره کلاس: جستارهای ریاضی

الف) $2-x \geq 0 \Rightarrow x \leq 2$ - $4-\sqrt{2-x} \geq 0 \Rightarrow 2-x \leq 14 \Rightarrow x \geq -12$ دامنه: $[2, 14]$ - $-12 \leq x \leq 2$	۱
ب) $x-2 \geq 0 \Rightarrow x \geq 2$ $3-\sqrt{x-2} \geq 0 \Rightarrow \sqrt{x-2} \leq 3 \Rightarrow x-2 \leq 9 \Rightarrow x \leq 11$ $\Rightarrow x-2 \in [0, 9] \Rightarrow x \in [2, 11]$	۲
الف) $4-2x^2 \geq 0 \Rightarrow 2x^2 \leq 4 \Rightarrow x^2 \leq 2 \Rightarrow x \in [-\sqrt{2}, \sqrt{2}]$ دامنه: $[-\sqrt{2}, \sqrt{2}]$	۳
ب) $3 x -9 \geq 0 \Rightarrow 3 x \geq 9 \Rightarrow x \geq 3$ $(-\infty, -3] \cup [3, +\infty)$	۴
الف) $ x-2 \neq 0 \Rightarrow x \neq 2$ $ x+3 > 0 \Rightarrow x > -3$ $D = \{x \in \mathbb{R} \mid x > 2\} = (-\infty, -2) \cup (2, \infty)$ $D = \mathbb{R} - \{\pm 2\}$	۵
ب) $x \geq 0$ $x \neq 9 \Rightarrow \sqrt{x} \neq 3 \Rightarrow \sqrt{x}-3 \neq 0$ $D = [0, \infty) \setminus \{9\} = [0, 9) \cup (9, \infty)$	۶
الف) $3- x+1 \geq 0 \Rightarrow x+1 \leq 3 \Rightarrow x \in [-4, 2]$ $D = [-4, 2]$	۷
ب) $ x -3 \neq 0 \Rightarrow x \neq 3$ $D = [-3, 3] - \{\pm 3\}$	۸
الف) $x+ x \geq 0$ $x \geq 0 \Rightarrow x+ x = 2x \geq 0 \Rightarrow x \geq 0$ $D = (0, \infty)$	۹
ب) $x x \geq 0$ $D = (0, \infty)$	۱۰

ا) $1 - [x] \geq 0 \Rightarrow [x] \leq 1 \quad D = \{x \in \mathbb{R} \mid [x] \leq 1\} = (-\infty, 2)$ (1,0)

ب) $1 - [x] > 0 \Rightarrow [x] < 1 \quad D = (-\infty, 1)$ (2)

ا) $x \neq 0, [x] \neq 0 \quad D = \mathbb{R} \setminus \{0\} \setminus \{x \in \mathbb{R} \mid [x] = 0\} = \mathbb{R} \setminus (-1, 1)$
 $D_f = \mathbb{R} - (-1, 1)$ (1,0)

ب) $-x[x] \geq 0$, $0 \leq x < 1 \Rightarrow -x[x] \leq 0 \Rightarrow [x] > 0 \Rightarrow x < 1$
 $-x[x] > 0 \Rightarrow [x] \leq -1 \quad D_f = \emptyset \quad D = (-\infty, 0)$

ا) $x - \frac{1}{x} = \begin{cases} n-1 & 0 < x < \frac{1}{x} \\ n & \frac{1}{x} \leq x < 1 \end{cases}, [x + \frac{1}{x}] = \begin{cases} n & 0 < x < \frac{1}{x} \\ n+1 & \frac{1}{x} \leq x < 1 \end{cases}$ (2)
 $[x - \frac{1}{x}] + [x + \frac{1}{x}] = \begin{cases} 2n-1, & 0 < x < \frac{1}{x} \\ 2n+1, & \frac{1}{x} \leq x < 1 \end{cases} \quad x \in [n, n+1) \Rightarrow n-1 \leq x < n$
 $D = [\frac{1}{x}] \subset [1, \infty)$
 ب) $S = \begin{cases} -1 & 0 < x < \frac{1}{x} \\ 0 & \frac{1}{x} \leq x < 1 \\ -1 & \frac{1}{x} \leq x < 1 \end{cases} \quad D = \{n + \frac{1}{x} \mid n \in \mathbb{Z}\}$

ا) $1 - \sin^2 x - 1 \neq 0 \Rightarrow \sin x \neq \pm 1 \quad D = \mathbb{R} \setminus \left\{ \frac{\pi}{2} + k\pi, \frac{3\pi}{2} + k\pi \mid k \in \mathbb{Z} \right\}$ (2)

ب) $\frac{\cot x + 1}{\tan x + 1} = \frac{\cos x}{\sin x} = \cot x \quad D = \mathbb{R} \setminus \left\{ \frac{\pi}{2} + k\pi, -\frac{\pi}{2} + k\pi \mid k \in \mathbb{Z} \right\}$
 $\sin x \neq 0 \Rightarrow x \neq k\pi$
 $\cos x \neq 0 \Rightarrow x \neq \frac{\pi}{2} + k\pi$
 $\tan x \neq -1 \Rightarrow x \neq -\frac{\pi}{4} + k\pi$

ا) $1 - \sin x - 1 \geq 0 \Rightarrow \sin x \geq \frac{1}{2} \quad D = \bigcup_{k \in \mathbb{Z}} \left[\frac{\pi}{6} + 2k\pi, \frac{5\pi}{6} + 2k\pi \right]$

ب) $D = k\pi \cup \left[\frac{\pi}{3} + 2k\pi, \frac{2\pi}{3} + 2k\pi \right]$ (2)