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الف) $\rightarrow I \quad 2-x \geq 0 \rightarrow x \leq 2$
 $\rightarrow II \quad x - \sqrt{2-x} \geq 0 \rightarrow x \geq \sqrt{2-x}$
 $14 \geq 2-x \rightarrow x \geq -12$
 $\Rightarrow I \cap II = x \geq -12 \wedge x \leq 2$
 $D_f = [-12, 2]$

ب) $\rightarrow I \quad x-2 \geq 0 \rightarrow x \geq 2$
 $\rightarrow II \quad x - \sqrt{x-2} \geq 0 \rightarrow x \geq \sqrt{x-2}$
 $9 \geq x-2 \rightarrow x \leq 11$
 $\Rightarrow I \cap II = 11 \geq x \geq 2$
 $D_f = [2, 11]$

الف) $x - 2x^2 \geq 0$
 $x(1-2x) \geq 0$
 $\Rightarrow \begin{matrix} \sqrt{2} & -\sqrt{2} \\ \uparrow & \uparrow \\ (1-\sqrt{2}) & (1+\sqrt{2}) \end{matrix} \geq 0$
 $\Rightarrow \begin{matrix} -\sqrt{2} & \sqrt{2} \\ | & | \\ - & + & - \end{matrix} \Rightarrow D_f = [-\sqrt{2}, \sqrt{2}]$

ب) $3|x| - 9 \geq 0$
 $|x| \geq 3 \rightarrow x \geq 3 \vee x \leq -3$
 $\Rightarrow D_f = (-\infty, -3] \cup [3, +\infty)$

الف) $|x| - 9 \neq 0 \rightarrow |x| \neq 9 \rightarrow D_f = \mathbb{R} - \{\pm 9\}$

ب) $\rightarrow I \quad x \geq 0$
 $\rightarrow II \quad \sqrt{x} - 3 \neq 0 \rightarrow x \neq 9$
 $\Rightarrow D_f = [0, +\infty) - \{9\}$

الف) $\rightarrow I \quad x - |x| \geq 0 \rightarrow x \geq |x| \Rightarrow -3 \leq x \leq 3$
 $\rightarrow II \quad |x| \neq -2$
 $\Rightarrow I \cap II = D_f = [-3, 3]$

ب) $\rightarrow I \quad x - x^2 \geq 0 \rightarrow (1-x)(1+x) \geq 0$
 $\Rightarrow \begin{matrix} 1 & -1 \\ \uparrow & \uparrow \\ 0 & 2 \end{matrix} \geq 0$
 $\Rightarrow \begin{matrix} -1 & 1 \\ | & | \\ - & + & - \end{matrix} \Rightarrow [-1, 1]$
 $\rightarrow II \quad |x| \neq 1 \rightarrow x \neq \pm 1$
 $\Rightarrow I \cap II = D_f = [-1, 1] - \{\pm 1\}$

الف) $x + |x| > 0 \rightarrow \begin{matrix} + & \checkmark \\ - & \times \\ 0 & \times \end{matrix} \Rightarrow D_f = \mathbb{R}^+ \wedge x > 0 \wedge (0, +\infty)$

ب) $x/|x| > 0 \rightarrow \begin{matrix} + & \checkmark \\ - & \times \\ 0 & \times \end{matrix} \Rightarrow D_f = \mathbb{R}^+ \wedge x > 0 \wedge (0, +\infty)$

الف) $x - [x] \geq 0 \rightarrow x \geq [x] \Rightarrow D_f = (-\infty, 1)$

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ب) $x - [x] > 0 \rightarrow x > [x] \rightarrow D_f = (-\infty, 1)$

الف) $x[x] \neq 0 \rightarrow$ ^{این ضرب هیچگاه صفر نیست} ^{منفی نشود} $\Rightarrow D_f = \mathbb{R} - \{0\}$
 $[x] \neq 0 \rightarrow x \neq [0, 1) \Rightarrow D_f = \mathbb{R} - [0, 1)$

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ب) $-x[x] > 0 \rightarrow x[x] < 0 \rightarrow D_f = \emptyset$

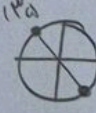
الف) $[x + \frac{1}{x} - 1] + [x + \frac{1}{x}] \geq 0 \rightarrow x[x + \frac{1}{x}] + 1 \geq 0 \rightarrow [x + \frac{1}{x}] \geq \frac{1}{x}$
 $x + \frac{1}{x} \geq 1 \Rightarrow x \geq \frac{1}{x} \Rightarrow D_f = [\frac{1}{x}, +\infty)$

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ب) $[x - \frac{1}{x}] + [-x + \frac{1}{x}] \Rightarrow$ if $\begin{cases} a \in \mathbb{Z} \Rightarrow [a] + [-a] = 0 \\ a \notin \mathbb{Z} \Rightarrow [a] + [-a] = -1 \end{cases} \Rightarrow a \in \mathbb{Z}$
 $D_f = \{x | x = k + \frac{1}{x}, k \in \mathbb{Z}\}$

الف) $x \sin^2 x - 1 \neq 0 \rightarrow \sin^2 x \neq \pm \frac{1}{x} \rightarrow \sin x \neq \pm \frac{1}{\sqrt{x}} \Rightarrow \sin x \neq \pm \frac{\sqrt{x}}{x}$
 $D_f = \mathbb{R} - \left\{ \frac{k\pi}{x} + \frac{\pi}{x} \right\}$

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ب) $\tan x + 1 \neq 0 \rightarrow \frac{\sin x}{\cos x} \neq -1 \rightarrow$  $\Rightarrow D_f = \mathbb{R} - \left\{ k\pi - \frac{\pi}{x} \right\}$
 $D_f = \mathbb{R} - \left\{ \frac{k\pi}{x}, k\pi - \frac{\pi}{x} \right\} \quad x \neq \frac{k\pi}{x} \leftarrow \cot, \tan \text{ باید تعریف شود}$

الف) $x \sin x - 1 \geq 0 \rightarrow \sin x \geq \frac{1}{x} \rightarrow$  $\Rightarrow D_f = \left[2k\pi + \frac{\pi}{x}, 2k\pi + \frac{5\pi}{x} \right]$

$D_f = \left[2k\pi + \frac{\pi}{x}, 2k\pi + \frac{5\pi}{x} \right] \leftarrow$ بازه‌ای که در آن تعریف نمی‌شود

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ب) $1 - x \cos x \geq 0 \rightarrow \frac{1}{x} \geq \cos x \Rightarrow$  $\Rightarrow D_f = \left[2k\pi + \frac{\pi}{x}, 2k\pi - \frac{\pi}{x} \right]$