

الف) $x \geq -14 \Rightarrow x^2 \geq \sqrt{2-x}$ و $x \leq 2 \Rightarrow [-14, 2]$

ب) $x \leq 11 \Rightarrow \sqrt{x-2} \leq 3$ و $x \geq 2 \Rightarrow [2, 11]$

الف) $|x| \leq \sqrt{2} \Rightarrow 4 - 2x^2 \geq 0 \Rightarrow [-\sqrt{2}, \sqrt{2}]$

ب) $|x| \geq 3 \Rightarrow 3|x| - 9 \geq 0 \Rightarrow (-\infty, -3] \cup [3, +\infty)$

الف) $|x| - 3 \neq 0 \Rightarrow |x| \neq \{-3, 3\} \Rightarrow D = \mathbb{R} - \{-3, 3\}$

ب) $\sqrt{x} - 2 \neq 0 \Rightarrow \sqrt{x} \neq 2 \Rightarrow x \neq 4 \Rightarrow D = [0, +\infty) - \{4\}$

الف) $3 - |x| \geq 0 \Rightarrow |x| \leq 3 \Rightarrow D = [-3, 3]$

ب) $\begin{cases} x \neq \pm 1 \\ x^2 \leq 4 \Rightarrow -2 \leq x \leq 2 \end{cases} \Rightarrow D = [-2, 2] - \{-1, 1\}$

الف) $\sqrt{2x} > 0 \Rightarrow D = (0, +\infty)$

ب) $x|x| = x^2 > 0 \Rightarrow D = (0, +\infty)$

$$[x] \leq 2 \Rightarrow D = (-\infty, 3) \quad \checkmark$$

(الف)

$$2 - [x] > 0 \Rightarrow [x] < 2 \Rightarrow (-\infty, 2) \quad \checkmark$$

(ب)

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$$[x] \neq 0, x \neq 0 \Rightarrow D = (-\infty, 0) \cup (1, \infty)$$

(الف)

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

(ب)

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$$D_f = \emptyset$$

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

(الف)

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$$D_f = [\frac{1}{x}, +\infty)$$

$$[x - \frac{1}{x}] + [-x + \frac{1}{x}] = 0 \Rightarrow -\frac{1}{x} < x < \frac{1}{x} \Rightarrow D = (-\frac{1}{x}, \frac{1}{x})$$

(ب)

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$$D_f = \{x \mid x = k + \frac{1}{x}, k \in \mathbb{Z}\}$$

$$\sin^2 x \neq \frac{1}{x} \Rightarrow x \neq \frac{\pi}{x} + k\pi, x \neq \frac{3\pi}{x} + k\pi \Rightarrow D = \mathbb{R} - \left\{ \frac{\pi}{x} + k\pi, \frac{3\pi}{x} + k\pi \right\}$$

(الف)

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$$x \neq \frac{\pi}{x} + k\pi, x \neq -\frac{\pi}{x} + k\pi \Rightarrow \tan x \neq -1 \Rightarrow D = \mathbb{R} - \left\{ \frac{\pi}{x} + k\pi, -\frac{\pi}{x} + k\pi \right\}$$

(ب)

$\tan x \neq -1$

$\cot x \neq -1$

$$D_f = \mathbb{R} - \left\{ \frac{k\pi}{x}, k\pi - \frac{\pi}{x} \right\}$$

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

(الف)

10

$$D_f = [xk\pi + \frac{\pi}{4}, xk\pi + \frac{5\pi}{4}]$$

$$\left\{ \begin{array}{l} \tan x + 1 \neq 0 \\ \cos x \neq 0 \end{array} \right\} \Rightarrow \tan x \neq -1$$

$$\Rightarrow D = \mathbb{R} - \left\{ -\frac{\pi}{x} + k\pi, \frac{\pi}{x} + k\pi \mid k \in \mathbb{Z} \right\}$$

(ب)

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$$D_f = \mathbb{R} - (xk\pi - \frac{\pi}{4}, xk\pi + \frac{\pi}{4})$$