

$$\text{الف) } \sqrt{x} - [x] \geq 0 \Rightarrow \sqrt{x} \geq [x] \Rightarrow D_f = (-\infty, 1)$$

$$\text{ب) } \left. \begin{array}{l} \sqrt{x} - [x] \geq 0 \\ \sqrt{x} - [x] \neq 0 \end{array} \right\} \Rightarrow \sqrt{x} - [x] > 0 \Rightarrow \sqrt{x} > [x] \Rightarrow D_f = (0, 1)$$

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$$\text{الف) } x[x] \neq 0$$

$$\begin{array}{c} 0 \quad 1 \\ + \quad | \quad + \\ \downarrow \quad \downarrow \\ 0 \quad 0 \end{array} \Rightarrow D_f = \mathbb{R} - [0, 1)$$

$$\text{ب) } -x[x] \geq 0$$

$$-x[x] \neq 0$$

$$\begin{array}{c} 0 \quad 1 \\ - \quad | \quad - \\ \downarrow \quad \downarrow \\ 0 \quad 0 \end{array} \Rightarrow D_f = \emptyset$$

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$$\text{الف) } \left[x - \frac{1}{\sqrt{x}} \right] + \left[x + \frac{\sqrt{x}}{x} \right] \geq 0 \Rightarrow \left[x + \frac{\sqrt{x}}{x} - 1 \right] + \left[x + \frac{\sqrt{x}}{x} \right] \geq 0$$

$$\left[x + \frac{\sqrt{x}}{x} \right] - 1 + \left[x + \frac{\sqrt{x}}{x} \right] = \sqrt{x} \left[x + \frac{\sqrt{x}}{x} \right] - 1 \geq 0 \Rightarrow \sqrt{x} \left[x + \frac{\sqrt{x}}{x} \right] \geq 1$$

$$\left[x + \frac{\sqrt{x}}{x} \right] \geq \frac{1}{\sqrt{x}} \Rightarrow x + \frac{\sqrt{x}}{x} \geq 1 \Rightarrow x \geq \frac{1}{\sqrt{x}} \Rightarrow D_f = \left[\frac{1}{\sqrt{x}}, +\infty \right)$$

$$\text{ب) } \left[x - \frac{1}{\sqrt{x}} \right] + \left[-x + \frac{1}{\sqrt{x}} \right] = \left[x - \frac{1}{\sqrt{x}} \right] + \left[-\left(x - \frac{1}{\sqrt{x}} \right) \right] \xrightarrow{\alpha \in \mathbb{Z} \quad [\alpha] + [\alpha] = 0} \xrightarrow{\alpha \notin \mathbb{Z} \quad [\alpha] + [\alpha] = -1}$$

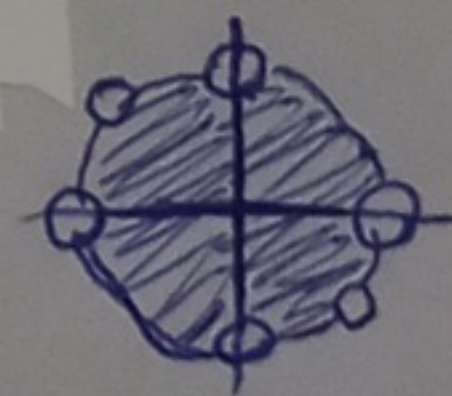
$$\Rightarrow x - \frac{1}{\sqrt{x}} \in \mathbb{Z} \Rightarrow D_f = \left\{ x \mid x = k + \frac{1}{\sqrt{x}}, k \in \mathbb{Z} \right\}$$

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

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$$\text{ب) } \tan x + 1 \neq 0 \Rightarrow \tan x \neq -1 \Rightarrow x \neq \frac{3\pi}{4}, \frac{7\pi}{4}$$

$$D_f = \mathbb{R} - \left\{ \frac{k\pi}{2}, \frac{k\pi}{2} + \frac{\pi}{4}, \frac{k\pi}{2} + \frac{3\pi}{4} \right\}$$



$$\text{الف) } \sqrt{x} \sin x - 1 \geq 0 \Rightarrow \sqrt{x} \sin x \geq 1 \Rightarrow \sin x \geq \frac{1}{\sqrt{x}}$$

$$\Rightarrow D_f = \left[\sqrt{k\pi + \frac{\pi}{4}}, \sqrt{k\pi + \frac{5\pi}{4}} \right]$$

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$$\text{ب) } 1 - \sqrt{x} \cos x \geq 0 \Rightarrow 1 \geq \sqrt{x} \cos x \Rightarrow \frac{1}{\sqrt{x}} \geq \cos x$$

$$D_f = \left[\sqrt{k\pi + \frac{\pi}{2}}, \sqrt{k\pi + \frac{3\pi}{2}} \right]$$

الف) $2-x \geq 0 \Rightarrow x \leq 2$ $\sqrt{4-x-x} \Rightarrow 4-2x-x \geq 0 \Rightarrow 4 \geq \sqrt{2-x} \Rightarrow 14 \geq 2-x$
 $\Rightarrow x \geq -14$ $D_f = [-14, 2]$

ب) $x-2 \geq 0 \Rightarrow x \geq 2$ $3-\sqrt{x-2} \geq 0 \Rightarrow 3 \geq \sqrt{x-2} \Rightarrow 9 \geq x-2$
 $\Rightarrow 11 \geq x$ $D_f = [2, 11]$

الف) $4-x^2 \geq 0 \Rightarrow 2-x^2 \geq 0 \Rightarrow 2 \geq x^2 \Rightarrow \sqrt{2} \geq x$
 $D_f = (-\infty, \sqrt{2}]$

ب) $3|x|-9 \geq 0 \Rightarrow 3|x| \geq 9 \Rightarrow |x| \geq 3 \Rightarrow x \geq 3 \text{ و } x \leq -3$
 $D_f = (-\infty, -3] \cup [3, +\infty)$

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

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

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

ب) $4-x^2 \geq 0 \Rightarrow 4 \geq x^2 \Rightarrow 2 \geq x, x \geq -2$
 $|x|-1 \neq 0 \Rightarrow |x| \neq 1 \Rightarrow x \neq \pm 1$ $D_f = [-2, 2] - \{-1, 1\}$

الف) $x+|x| \geq 0$
 $x+|x| \neq 0$ $\Rightarrow R^+ \checkmark \Rightarrow D_f = R^+$
 $0 \times$
 $R^- \times$

ب) $x|x| \geq 0$
 $x+|x| \neq 0$ $\Rightarrow R^+ \checkmark \Rightarrow D_f = R^+$
 $0 \times$
 $R^- \times$