

الف) $\begin{cases} x-x \geq 0 \Rightarrow x \leq 2 \\ x-\sqrt{x-x} \geq 0 \Rightarrow x-x \leq 1 \Rightarrow x \geq -1 \end{cases}$
 $D_f = [-1, 2]$ ✓

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

الف) $x-x^2 \geq 0 \Rightarrow x^2 \leq x \Rightarrow x^2 \leq 1 \Rightarrow -1 \leq x \leq 1$
 $D_f = [-1, 1]$
 ب) $3|x|-9 \geq 0 \Rightarrow 3|x| \geq 9 \Rightarrow |x| \geq 3 \Rightarrow \begin{cases} x \geq 3 \\ x \leq -3 \end{cases}$
 $D_f = (-\infty, -3] \cup [3, +\infty)$ (1, 175) ✓

الف) $|x|-3 \neq 0 \Rightarrow |x| \neq 3 \Rightarrow x \neq \pm 3$
 $D_f = \mathbb{R} - \{\pm 3\}$ (1, 15)
 ب) $\sqrt{x}-3 \neq 0 \Rightarrow \sqrt{x} \neq 3 \Rightarrow x \neq 9, \sqrt{x} \geq 0 \Rightarrow x \geq 0$
 $D_f = \mathbb{R} - \{9\} \cap [0, +\infty) = [0, 9) \cup (9, +\infty)$

الف) $\begin{cases} 3-|x| \geq 0 \Rightarrow |x| \leq 3 \Rightarrow -3 \leq x \leq 3 \\ |x|+2 \neq 0 \Rightarrow |x| \neq -2 \end{cases}$
 $D_f = [-3, 3]$ ✓
 ب) $\begin{cases} x-x^2 \geq 0 \Rightarrow x^2 \leq x \Rightarrow x \leq 2 \Rightarrow -2 \leq x \leq 2 \\ |x|-1 \neq 0 \Rightarrow |x| \neq 1 \Rightarrow x \neq \pm 1 \end{cases}$
 $D_f = [-2, 2] - \{\pm 1\} = [-2, -1) \cup (-1, 1) \cup (1, 2]$

الف) $-x+|x|$
 $\oplus \Rightarrow$ ✓
 $\ominus \Rightarrow$ x منفرجه
 $\odot \Rightarrow$ x خارج المجال
 $D_f = (-\infty, +\infty) \subseteq D_f = \mathbb{R}^+$ ✓
 ب) $x|x| \neq 0$
 $\oplus \Rightarrow$ ✓
 $\ominus \Rightarrow$ x غير راضية
 $\odot \Rightarrow$ x خارج المجال
 $D_f = (-\infty, +\infty) \subseteq D_f = \mathbb{R}^+$

الف) $2-[x] \geq 0 \Rightarrow [x] \leq 2 \Rightarrow x < 3$
 $D_f = (-\infty, 3)$ ✓
 ب) $2-[x] > 0 \Rightarrow [x] < 2 \Rightarrow x < 2$
 $D_f = (-\infty, 2)$

الف) $x[x]$ ثبات العنصر
 $x[x] \neq 0 \Rightarrow D_f = \mathbb{R} - [0, 1)$
 ب) $D_f = \emptyset$ ✓

الف) $[x-\frac{1}{x}] + [x+\frac{y}{x}] \geq 0$
 $\Rightarrow [x+\frac{y}{x}-1] + [x+\frac{y}{x}] \geq 0 \Rightarrow [x+\frac{y}{x}]-1 + [x+\frac{y}{x}] \geq 0$
 $\Rightarrow 2[x+\frac{y}{x}] \geq 1 \Rightarrow [x+\frac{y}{x}] \geq \frac{1}{2}$
 $\Rightarrow x+\frac{y}{x} \geq 1 \Rightarrow x \geq \frac{1}{x}$
 $D_f = [\frac{1}{x}, +\infty)$ ✓

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

الف) $2\sin^2 x - 1 \neq 0 \Rightarrow 2\sin^2 x \neq 1$
 $\Rightarrow \sin^2 x \neq \frac{1}{2} \Rightarrow \sin x \neq \pm \frac{\sqrt{2}}{2}$

 $D_f = \mathbb{R} - \{k\pi + \frac{\pi}{4}, k\pi + \frac{3\pi}{4}\}$
 ب) $\begin{cases} \tan x \neq 1 \\ \sin x \neq 0 \end{cases}$

 $D_f = \mathbb{R} - \{k\pi, k\pi + \frac{\pi}{4}\}$

الف) $2\sin x - 1 \geq 0 \Rightarrow 2\sin x \geq 1 \Rightarrow \sin x \geq \frac{1}{2}$

 $D_f = [2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}]$
 $D_f = [2k\pi + \frac{\pi}{6}, 2k\pi + \pi - \frac{\pi}{6}]$ ✓

ب) $1-2\cos x \geq 0 \Rightarrow 2\cos x \leq 1 \Rightarrow \cos x \leq \frac{1}{2}$

 $D_f = [2k\pi + \frac{2\pi}{3}, 2k\pi + \frac{4\pi}{3}]$ ✓

الف) $2-[x] \geq 0 \Rightarrow [x] \leq 2 \Rightarrow x < 3$
 $D_f = (-\infty, 3)$ ✓
 ب) $2-[x] > 0 \Rightarrow [x] < 2 \Rightarrow x < 2$
 $D_f = (-\infty, 2)$