

الف) $y = \sqrt{\frac{x^2-4x}{x^2-x}} \rightarrow \frac{x^2-4x}{x^2-x} \geq 0 \rightarrow \frac{x(x-4)}{x(x-1)} \geq 0$ $D_f = (-\infty, 0) \cup (4, \infty)$

ب) $y = \sqrt{\frac{x^2-x^2}{x^2-x}} \rightarrow \frac{x^2-x^2}{x^2-x} \geq 0 \rightarrow \frac{x^2(x-1)}{x(x-1)} = x \geq 0$ $D_f = [0, \infty)$

الف) $y = \frac{x+1}{\sqrt{x+|x|}} \rightarrow x+|x| > 0 \rightarrow x > -|x| \rightarrow D_f = \mathbb{R}$

ب) $y = \frac{1}{\sqrt{x|x|}} \rightarrow x|x| > 0 \rightarrow D_f = [0, \infty)$

الف) $y = \sqrt{x-[x]} \rightarrow x-[x] \geq 0 \rightarrow x \geq [x] \rightarrow D_f = [0, \infty)$

ب) $y = \frac{1}{\sqrt{x-[x]}} \rightarrow x-[x] > 0 \rightarrow [x] < x \rightarrow D_f = (-\infty, 0)$

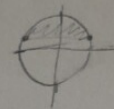
الف) $y = \sqrt{[x-\frac{1}{x}] + [x+\frac{1}{x}]} \rightarrow [x-\frac{1}{x}] + [x+\frac{1}{x}] \geq 0 \rightarrow [x-\frac{1}{x}+1] + [x+\frac{1}{x}-1] \geq 0$
 $2[x-\frac{1}{x}] + 1 \geq 0 \rightarrow [x-\frac{1}{x}] \geq -\frac{1}{2} \rightarrow x-\frac{1}{x} \geq 0 \rightarrow D_f = [\frac{1}{2},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

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

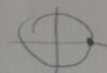
الف) $y = \frac{x}{\sin x-1} \rightarrow \sin x-1 \neq 0 \rightarrow \sin x \neq 1$ $D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}, k \in \mathbb{Z}\}$

ب) $y = \frac{x}{\sin^2 x-1} \rightarrow \sin^2 x-1 \neq 0 \rightarrow \sin^2 x \neq 1 \rightarrow \sin x \neq \pm 1$ $D_f = \mathbb{R} - \{k\pi \pm \frac{\pi}{2}, k \in \mathbb{Z}\}$

الف) $y = \sqrt{\sin x-1} \rightarrow \sin x-1 \geq 0 \rightarrow \sin x \geq 1 \rightarrow \sin x = 1 \rightarrow D_f = \{2k\pi + \frac{\pi}{2}, k \in \mathbb{Z}\}$



ب) $y = \sqrt{\cos x-1} \rightarrow \cos x-1 \geq 0 \rightarrow \cos x \geq 1 \rightarrow \cos x = 1 \rightarrow D_f = \{2k\pi, k \in \mathbb{Z}\}$



الف) $\cos y = |x|-2 \rightarrow -1 \leq |x|-2 \leq 1 \rightarrow -1 \leq |x| \leq 3 \rightarrow D_f = [-3, -1] \cup [1, 3]$

ب) $y = \arcsin(x^2+3x+1) \rightarrow -1 \leq x^2+3x+1 \leq 1$
 $x^2+3x+2 \geq 0 \rightarrow (x+1)(x+2) \geq 0$
 $x^2+3x \leq 0 \rightarrow x(x+3) \leq 0$
 $D_f = [-2, -1] \cup [-1, 0]$

الف) $y = \sqrt{x-10} \rightarrow x-10 \geq 0 \rightarrow x \geq 10 \rightarrow D_f = [10, \infty)$

ب) $y = \log(x^2-x) \rightarrow x^2-x > 0 \rightarrow x(x-1) > 0 \rightarrow D_f = (-\infty, 0) \cup (1, \infty)$

الف) $y = \frac{x}{x^2+1} \rightarrow x^2+1 \neq 0 \rightarrow x^2 \neq -1 \rightarrow D_f = \mathbb{R}$

ب) $y = \frac{x}{x^2-1} \rightarrow x^2-1 \neq 0 \rightarrow x^2 \neq 1 \rightarrow x \neq \pm 1 \rightarrow D_f = \mathbb{R} - \{-1, 1\}$

ج) $y = \frac{x}{x^2-x} \rightarrow x^2-x \neq 0 \rightarrow x^2 \neq x \rightarrow x \neq 1 \rightarrow D_f = \mathbb{R} - \{1\}$

د) $y = \frac{x}{x^2-x} \rightarrow x^2-x \neq 0 \rightarrow x^2 \neq x \rightarrow x \neq 1 \rightarrow D_f = \mathbb{R} - \{1\}$

الف) $y = (x+1)! \rightarrow x+1 \in \mathbb{N} \rightarrow x \in \mathbb{N}-1 \rightarrow D_f = \{x | x = k-1, k \in \mathbb{N}\}$

ب) $y = \left(\frac{x^2-x}{x^2-x}\right)! \rightarrow \frac{x^2-x}{x^2-x} \in \mathbb{N} \rightarrow \frac{x^2-x}{x^2-x} = 1 \rightarrow D_f = \{x | x = k, k \in \mathbb{N}\}$