

الف $y = \sqrt{x-2} - \sqrt{x-4} \Rightarrow x-2 \geq 0 \Rightarrow x \geq 2$ $\quad \quad \quad \text{ب} \quad y = \sqrt{x-4} - \sqrt{x-2} \Rightarrow x-4 \geq 0 \Rightarrow x \geq 4$

$\Rightarrow x \geq 2 \Rightarrow 4 \geq x-2 \Rightarrow x \leq 6 \Rightarrow x \geq -4$ $\quad \quad \quad \text{د} \quad y = \sqrt{x-2} + \sqrt{x-4} \Rightarrow x-2 \geq 0 \Rightarrow x \geq 2$

$D_f = I \cap II = 2 \leq x \leq 6$ $\quad \quad \quad \text{ه} \quad y = \sqrt{x-4} + \sqrt{x-2} \Rightarrow x-4 \geq 0 \Rightarrow x \geq 4$

$\Rightarrow 4 \leq x-2 \Rightarrow x \geq 6 \Rightarrow x \geq 2$ $\quad \quad \quad D_f = I \cap II = 4 \leq x \leq 6$

الف $y = \sqrt{x^2 - 4x^2} \Rightarrow x^2 - 4x^2 \geq 0 \Rightarrow x^2 \geq 4x^2 \Rightarrow 2 \geq x^2 \Rightarrow \sqrt{2} \geq x$

ب $y = \sqrt{3|x| - 9} \Rightarrow 3|x| - 9 \geq 0 \Rightarrow 3|x| \geq 9 \Rightarrow |x| \geq 3$

$\Rightarrow D_f = x \geq 3 \cup x \leq -3$

الف $y = \frac{|x|+1}{|x|-4}$ $\Rightarrow |x|-4 \neq 0 \Rightarrow |x| \neq 4$

$\Rightarrow D_f = \mathbb{R} - \{4, -4\}$

ب $y = \frac{\sqrt{|x|+1}}{\sqrt{x}-4}$ $\Rightarrow x \geq 0$ $\quad \quad \quad \text{د} \quad y = \frac{\sqrt{|x|+1}}{\sqrt{x}-4}$ $\Rightarrow \sqrt{x}-4 \neq 0 \Rightarrow \sqrt{x} \neq 4 \Rightarrow x \neq 16$

$D_f = \{x \mid x \geq 0, x \neq 16\}$

الف $y = \frac{\sqrt{x-|x|}}{|x|+2}$ $\Rightarrow x-|x| \geq 0 \Rightarrow x \geq |x| \Rightarrow x \geq x \Rightarrow x \geq -x \Rightarrow x \geq 0$

$|x|+2 \neq 0 \Rightarrow D_f = \{x \mid x \geq 0, x \neq -2\}$

ب $y = \frac{\sqrt{x-x^2}}{|x|+1}$ $\Rightarrow x-x^2 \geq 0 \Rightarrow x \geq x^2 \Rightarrow x+2 \geq x^2 \Rightarrow x^2 - x - 2 \leq 0$

$|x|+1 \neq 0 \Rightarrow x \neq \pm 1 \quad D_f = \{x \mid -2 \leq x \leq 2, x \neq \pm 1\}$

الف $y = \frac{x+1}{\sqrt{x}+|x|}$ $x \geq 0, \sqrt{x}+|x| \neq 0 \Rightarrow$

$\Rightarrow D_f = \{x \mid x \geq 0\}$

ب $y = \frac{1}{\sqrt{x|x|}}$ $\Rightarrow x|x| > 0 \Rightarrow x \neq 0$

$D_f = \mathbb{R} - \{0\}$

الف $y = \sqrt{x - [x]} \Rightarrow x - [x] \geq 0 \Rightarrow x \geq [x] \Rightarrow x < x$
 $D_f = \{x \mid x \in \mathbb{R}, x < x\}$

ب $y = \frac{1}{\sqrt{x - [x]}}$ $x - [x] > 0 \Rightarrow x > [x] \Rightarrow x < x$
 $D_f = \{x \mid x \in \mathbb{R}, x < x\}$

الف $y = \frac{1}{x[x]}$ $x[x] \neq 0 \Rightarrow D_f = \mathbb{R} - (1, 0]$

ب $y = \frac{1}{\sqrt{-x[x]}}$ $-x[x] > 0 \Rightarrow D_f = \emptyset$

الف $\sqrt{[x - \frac{1}{x}] + [x + \frac{1}{x}]} \Rightarrow [x - \frac{1}{x}] + [x + \frac{1}{x}] \geq 0 \Rightarrow [x + \frac{1}{x} - 1] + [x - \frac{1}{x}] \geq 0$
 $[x + \frac{1}{x}] \geq 1 \quad [x + \frac{1}{x}] \geq \frac{1}{x} \Rightarrow x \geq -\frac{1}{4} \Rightarrow D_f = [-\frac{1}{4}, +\infty)$

ب $\sqrt{[x - \frac{1}{x}] + [-x + \frac{1}{x}]} \Rightarrow [x - \frac{1}{x}] + [-x + \frac{1}{x}] \geq 0$ if $\begin{cases} x \in \mathbb{Z} & [x] + [-x] = 0 \\ x \notin \mathbb{Z} & [x] + [-x] = -1 \end{cases}$
 $= x - \frac{1}{x} \in \mathbb{Z} \Rightarrow D_f = \{x \mid x = k + \frac{1}{x}, k \in \mathbb{Z}\}$

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

ب $\frac{\cot x + 1}{\tan x + 1}$ $\cot x + 1 \neq 0 \Rightarrow x \neq 110^\circ, 270^\circ$, $\tan x + 1 \neq 0 \Rightarrow \tan x \neq -1$
 $\Rightarrow x \neq 135^\circ, 315^\circ$ $D_f = \mathbb{R} - \{k\pi + \frac{\pi}{2}, k\pi + \frac{3\pi}{2}, k\pi + \frac{\pi}{4}, k\pi + \frac{5\pi}{4}\}$

الف $y = \sqrt{x \sin x - 1}$ $x \sin x - 1 \geq 0 \Rightarrow \sin x \geq \frac{1}{x}$
 $D_f = (k\pi + \frac{\pi}{2}, k\pi + \frac{\omega\pi}{2})$

ب $y = \sqrt{1 - x \cos x}$ $1 - x \cos x \geq 0 \Rightarrow 1 \geq x \cos x \Rightarrow \frac{1}{x} \geq \cos x$
 $D_f = (k\pi + \frac{\omega\pi}{4}, k\pi + \frac{\pi}{4})$