

الف)  $y = \sqrt{4-2x-x}$   $\begin{cases} 2-x \geq 0 \Rightarrow x \leq 2 \quad (I) \\ 4-2x-x \geq 0 \Rightarrow 4 \geq 3x \Rightarrow 1.33 \geq x \Rightarrow x \leq 1.33 \quad (II) \end{cases}$

$D_f = I \cap II \Rightarrow D_f = [0, 1.33]$

ب)  $y = \sqrt{4-\sqrt{x-2}}$   $\begin{cases} x-2 \geq 0 \Rightarrow x \geq 2 \quad (I) \\ 4-\sqrt{x-2} \geq 0 \Rightarrow 4 \geq \sqrt{x-2} \Rightarrow 16 \geq x-2 \Rightarrow x \leq 18 \quad (II) \end{cases}$

$D_f = I \cap II \Rightarrow D_f = [2, 18]$

الف)  $y = \sqrt{4-2x^2} \Rightarrow |4-2x^2| \geq 0 \Rightarrow \begin{cases} 4-2x^2 \geq 0 \Rightarrow 2 \geq x^2 \Rightarrow x \leq \sqrt{2} \text{ or } x \geq -\sqrt{2} \\ 4-2x^2 \leq 0 \Rightarrow 2 \leq x^2 \Rightarrow x \leq -\sqrt{2} \text{ or } x \geq \sqrt{2} \end{cases}$

$D_f = (-\infty, -\sqrt{2}] \cup [\sqrt{2}, \infty)$

ب)  $y = \sqrt{3|x|-9} \Rightarrow 3|x|-9 \geq 0 \Rightarrow |x| \geq 3 \Rightarrow \begin{cases} x \geq 3 \\ x \leq -3 \end{cases}$

$D_f = (-\infty, -3] \cup [3, \infty)$

الف)  $y = \sqrt[3]{\frac{|x|+1}{|x|-3}} \Rightarrow |x|-3 \neq 0 \Rightarrow |x| \neq 3 \Rightarrow x \neq \pm 3$   $D_f = R - \{\pm 3\}$

ب)  $y = \sqrt{\frac{\sqrt{x}+1}{\sqrt{x}-3}} \Rightarrow \begin{cases} x \geq 0 \\ \sqrt{x} \neq 3 \Rightarrow x \neq 9 \end{cases} D_f = [0, \infty) - \{9\}$

الف)  $y = \frac{\sqrt{3-|x|}}{|x|+2} \Rightarrow \begin{cases} 3-|x| \geq 0 \Rightarrow 3 \geq |x| \Rightarrow -3 \leq x \leq 3 \quad (I) \\ |x|+2 \neq 0 \Rightarrow |x| \neq -2 \quad (II) \end{cases} I \cap II \Rightarrow D_f = [-3, 3]$

ب)  $y = \frac{\sqrt{4-x^2}}{|x|-1} \Rightarrow \begin{cases} 4-x^2 \geq 0 \Rightarrow -2 \leq x \leq 2 \\ |x|-1 \neq 0 \Rightarrow |x| \neq 1 \Rightarrow x \neq \pm 1 \end{cases} D_f = (-2, -1) \cup (-1, 1) \cup (1, 2]$

الف)  $y = \frac{x+1}{\sqrt{x+|x|}} \Rightarrow \begin{cases} x \geq 0 \\ x+1 \geq 0 \end{cases} D_f = R^+ \cup (0, \infty)$

$x+|x| > 0 \Rightarrow |x| > -x \Rightarrow R^+$

ب)  $y = \frac{1}{\sqrt{x|x|}}$   $\begin{cases} x \geq 0 \\ x \neq 0 \end{cases} D_f = R^+ \cup (0, \infty)$

$$\text{الف) } y = \sqrt{2 - [x]} \Rightarrow 2 - [x] \geq 0 \Rightarrow 2 \geq [x] \rightarrow D_f = (-\infty, 2)$$

$$\text{ب) } y = \frac{1}{\sqrt{2 - [x]}} \Rightarrow 2 - [x] > 0 \Rightarrow 2 > [x] \rightarrow D_f = (-\infty, 2)$$

$$\text{الف) } y = \frac{1}{x[x]} \Rightarrow \begin{matrix} 0 & x \\ + & \checkmark \\ - & \checkmark \end{matrix} \quad D_f = \mathbb{R} \cdot \{0\}$$

$$\text{ب) } y = \frac{1}{\sqrt{1 - x[x]}} \Rightarrow -x[x] > 0 \Rightarrow x[x] < 0$$

\$x, [x]\$ هر يك از آنها منفی باشند

$$\begin{matrix} 0 & x \\ + & \times \\ - & \times \end{matrix} \quad D_f = \emptyset$$

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

$$\left[x + \frac{1}{x}\right] - 1 + \left[x + \frac{1}{x}\right] \geq 0 \Rightarrow 2\left[x + \frac{1}{x}\right] \geq 1 \Rightarrow \left[x + \frac{1}{x}\right] \geq \frac{1}{2} \Rightarrow x + \frac{1}{x} \geq 1$$

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

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

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

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

$$D_f = \mathbb{R} - \left\{2k\pi + \frac{\pi}{4}, 2k\pi + \frac{5\pi}{4}\right\}$$

$$\text{ب) } y = \frac{\cot x + 1}{\tan x + 1} \Rightarrow \tan x + 1 \neq 0 \Rightarrow \frac{\sin x}{\cos x} \neq -1 \Rightarrow D_f = \mathbb{R} - \left\{k\pi - \frac{\pi}{4}, k\pi - \frac{3\pi}{4}\right\}$$

$$\text{الف) } y = \sqrt{2 \sin x - 1} \Rightarrow 2 \sin x - 1 \geq 0 \Rightarrow \boxed{\sin x \geq \frac{1}{2}}$$

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



$$\text{ب) } y = \sqrt{1 - 2 \cos x} \Rightarrow 1 - 2 \cos x \geq 0 \Rightarrow -2 \cos x \geq -1 \Rightarrow \boxed{\cos x \leq \frac{1}{2}}$$



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