

الف) $y = \sqrt{\frac{x^2 - 9x}{x^2 - x}}$ $\rightarrow$ $\frac{x}{y} \mid \begin{array}{cccc} -1 & 0 & 1 & 2 \\ -\frac{1}{x} & +\frac{1}{x} & +\frac{1}{x} & -\frac{1}{x} \end{array}$ $\rightarrow D_f = (-1, 1) \cup [6, +\infty) - \{0\}$

ب) $y = \sqrt{\frac{x^3 - x^2}{x^2 - x}}$ $\rightarrow$ $\frac{x}{y} \mid \begin{array}{cccc} -1^* & 0^* & 1^* & \\ -\frac{1}{x} & +\frac{1}{x} & +\frac{1}{x} & +\frac{1}{x} \end{array}$ $D_f = \mathbb{R} - \{-1, 0, 1\}$

الف) $y = \frac{x+1}{\sqrt{x+|x|}}$ $\rightarrow$ ~~$x+|x| > 0 \rightarrow x > 0$~~ $\Rightarrow$ مثبت $\rightarrow D_f = (0, +\infty)$

ب) $y = \frac{1}{\sqrt{x|x|}}$ $\rightarrow$ ~~$x|x| > 0 \rightarrow x > 0$~~ $\Rightarrow$ مثبت $\rightarrow D_f = (0, +\infty)$

الف) $y = \sqrt{2-[x]}$ $\rightarrow$ ~~$2-[x] \geq 0 \rightarrow [x] \leq 2 \rightarrow x < 3 \rightarrow D_f = (-\infty, 3)$~~

ب) $y = \frac{1}{\sqrt{2-[x]}}$ $\rightarrow$ ~~$2-[x] > 0 \rightarrow [x] < 2 \rightarrow x < 3 \rightarrow D_f = (-\infty, 3)$~~

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

ب) $y = \sqrt{[x - \frac{1}{p}] + [-x + \frac{1}{p}]}$ $\rightarrow y = \sqrt{[x - \frac{1}{p}] + [-(x - \frac{1}{p})]}$ if $a \in \mathbb{Z}$ $[a] + [-a] = 0$ ✓
 $a \notin \mathbb{Z}$ $[a] + [-a] = -1$
 $D_f = \{x \mid x = k + \frac{1}{p}, k \in \mathbb{Z}\} \leftarrow x - \frac{1}{p} \in \mathbb{Z} \leftarrow a \in \mathbb{Z}$

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

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

الف) $y = \sqrt{1 - \sin x} \rightarrow 1 - \sin x \geq 0 \rightarrow \sin x \leq 1 \rightarrow \sin x \geq \frac{1}{2} \rightarrow$ 

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

ب) $y = \sqrt{\cos x - 1} \rightarrow \cos x - 1 \geq 0 \rightarrow \cos x \geq 1 \rightarrow$ 

$\rightarrow D_f = \{2k\pi\}$

الف) $\cos y = |x| - 2 \rightarrow -1 \leq |x| - 2 \leq 1 \rightarrow 1 \leq |x| \leq 3 \rightarrow -3 \leq x \leq -1$ 

$\rightarrow D_f = [-3, -1] \cup [1, 3]$

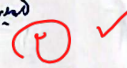
ب) $\arcsin(x^2 + 2x + 1) \rightarrow -1 \leq x^2 + 2x + 1 \leq 1 \rightarrow x^2 + 2x + 1 \leq 1 \rightarrow x^2 + 2x \leq 0$

$\rightarrow \frac{x(x+2)}{(x+1)(x+1)} \leq 0 \rightarrow \frac{x}{x+1} \leq 0 \rightarrow \frac{x}{x+1} \leq 0 \rightarrow D_f = [-2, 0] \cup [0, 2] \cup [-1, +\infty)$

الف) $y = \sqrt{2 - \log_r(x-2)} \rightarrow x-2 > 0 \rightarrow x > 2$ 
 $2 - \log_r(x-2) \geq 0 \rightarrow \log_r(x-2) \leq 2$
 $x-2 \leq r^2 = 9 \rightarrow x \leq 11$
 $\rightarrow D_f = (2, 11]$

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

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

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

ج) $y = \frac{x}{x^2 - 2} \rightarrow x^2 - 2 \neq 0 \rightarrow x^2 \neq 2 \rightarrow x \neq \pm \sqrt{2} \rightarrow D_f = \mathbb{R} - \left\{ \pm \sqrt{2} \right\}$

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

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

ب) $y = \left(\frac{x^2 - 1}{x^2 - 8} \right)!$ $\rightarrow \frac{x^2 - 1}{x^2 - 8} \in \mathbb{N} \rightarrow \frac{-\partial \mathbb{N} - (-1)}{x^2 - 8} = x \rightarrow x = \frac{\partial \mathbb{N} - 1}{x^2 - 8}$ 

$\rightarrow D_f = \left\{ x \mid x = \frac{\partial k - 1}{x^2 - 8}, k \in \mathbb{N} \right\}$

$D_f = [-2, -1] \cup [-1, 0]$ 