

الف) $y = \frac{x+c}{x^2+cx-1}$ $\Rightarrow x^2+cx-1 \div x-1 = x^2+cx-1$
 $\Rightarrow x^2+cx-1=0 \Rightarrow (x-1)(x+1)=0 \Rightarrow x=1, -1$
 $\Rightarrow D_f = \mathbb{R} - \{1, -1\}$
 ب) $y = \frac{x+c}{x^2+cx+1}$ $\Rightarrow x^2+cx+1 \div x+1 = x^2+cx+1$
 $\Rightarrow x^2+cx+1=0 \Rightarrow (x+1)(x+1)=0 \Rightarrow x=-1$
 $\Rightarrow D_f = \mathbb{R} - \{-1\}$

الف) $y = \frac{x+c}{x^2-2x+1}$ $\Rightarrow x^2-2x+1 \div x-1 = x-1$
 $\Rightarrow x^2-2x+1=0 \Rightarrow (x-1)^2=0 \Rightarrow x=1$
 $\Rightarrow D_f = \mathbb{R} - \{1\}$
 ب) $y = \frac{x+c}{x^2+9x+10}$ $\Rightarrow x^2+9x+10 \div x+1 = x^2+9x+10$
 $\Rightarrow x^2+9x+10=0 \Rightarrow (x+1)(x+10)=0 \Rightarrow x=-1, -10$
 $\Rightarrow D_f = \mathbb{R} - \{-1, -10\}$

الف) $y = \frac{x}{x^2-2x+1}$ $\Rightarrow x^2-2x+1 \neq 0 \Rightarrow (x-1)^2 \neq 0 \Rightarrow x \neq 1$
 ب) $y = \frac{x}{x^2+cx}$ $\Rightarrow x^2+cx \neq 0 \Rightarrow x(x+c) \neq 0 \Rightarrow x \neq 0, -c$
 $\Rightarrow D_f = \mathbb{R} - \{0, -c\}$

الف) $y = \sqrt{[x]-1}$ $\Rightarrow [x]-1 \geq 0 \Rightarrow [x] \geq 1 \Rightarrow D_f = \{1, 2, 3, \dots\}$

ب) $y = \frac{[x]+4}{[x]^2-2[x]-1}$ $\Rightarrow [x]^2-2[x]-1 \neq 0 \Rightarrow ([x]-3)([x]+1) \neq 0$
 $\Rightarrow D_f = \mathbb{R} - \{3, -1\}$

الف) $y = \sqrt{[x-\frac{1}{2}]+[x+\frac{1}{2}]}$ $\Rightarrow [x-\frac{1}{2}]+[x+\frac{1}{2}] \geq 0 \Rightarrow [x] \geq -\frac{1}{2} \Rightarrow D_f = \{0, 1, 2, \dots\}$
 ب) $y = \sqrt{[x-\frac{1}{2}]+[\frac{1}{x}-x]}$ $\Rightarrow [x-\frac{1}{2}]+[\frac{1}{x}-x] \geq 0$
 $\Rightarrow x - \frac{1}{2} \in \mathbb{Z} \Rightarrow D_f = \{x \mid x = k + \frac{1}{2}, k \in \mathbb{Z}\}$

$$\text{all } y = \frac{\cos x + 1}{\cos x - 1} \quad \cos x + 1 \neq 0 \Rightarrow \cos x \neq -1 \Rightarrow D_f = \mathbb{R} - \left(\frac{\pi}{2} \cup \frac{3\pi}{2} \right)$$

$$y = \sqrt{1 - \varepsilon \sin^2 x} \quad 1 - \varepsilon \sin^2 x \geq 0 \Rightarrow \sin^2 x \leq \frac{1}{\varepsilon} \Rightarrow \sin x \geq \frac{1}{\sqrt{\varepsilon}}, \sin x \leq \frac{1}{\sqrt{\varepsilon}}$$


$$\Rightarrow D_f = \mathbb{R} - \left(\frac{\pi}{2} \cup \frac{3\pi}{2} \right)$$

$$\text{all } y = \sqrt{\varepsilon \sin x - 1} \quad \varepsilon \sin x - 1 \geq 0 \Rightarrow \sin x \geq \frac{1}{\varepsilon}$$


$$\Rightarrow D_f = \left[\frac{\pi}{2}, \frac{3\pi}{2} \right]$$

$$y = \sqrt{1 - \varepsilon \cos x} \quad 1 - \varepsilon \cos x \geq 0 \Rightarrow \cos x \leq \frac{1}{\varepsilon}$$


$$\Rightarrow D_f = \left[\frac{\pi}{2}, \frac{3\pi}{2} \right]$$

$$\text{all } y = \sin(x + \varepsilon x + 1) \quad -1 \leq \sin(x + \varepsilon x + 1) \leq 1$$

$$\Rightarrow -1 \leq \sin(x + \varepsilon x + 1) \leq 0 \Rightarrow x + \varepsilon x + 1 \leq 0 \Rightarrow \frac{-1 - \varepsilon}{1 + \varepsilon} \leq x \leq 0$$

$$y = \cos(x + \varepsilon x + 1) \quad 1 \geq \cos(x + \varepsilon x + 1) \geq -1 \Rightarrow x + \varepsilon x + 1 \geq 0 \Rightarrow \frac{-1 - \varepsilon}{1 + \varepsilon} \leq x \leq 0$$

$$\Rightarrow D_f = \left[\frac{-1 - \varepsilon}{1 + \varepsilon}, 0 \right] \cup [1, 0]$$

$$\text{all } y = \log(1 - \log \frac{x}{e}) \quad x > 0, 1 - \log \frac{x}{e} > 0 \Rightarrow \log \frac{x}{e} < 1$$

$$x < e \Rightarrow x < e \Rightarrow D_f = \mathbb{R} - (0, e)$$

$$y = \log \left(1 - \log \frac{x}{e} \right) \quad x > 0, 1 - \log \frac{x}{e} > 0 \Rightarrow \log \frac{x}{e} < 1$$

$$\Rightarrow x \in (0, \frac{1}{e}) \Rightarrow D_f = (0, \frac{1}{e})$$

$$\text{all } y = \sqrt{\varepsilon x - x^2} \quad \varepsilon x - x^2 \geq 0 \Rightarrow x(\varepsilon - x) \geq 0 \Rightarrow x \leq \varepsilon$$

$$\Rightarrow D_f = \mathbb{R} - (0, \varepsilon)$$

$$y = \frac{x + \varepsilon}{x + 1} \quad \frac{x + \varepsilon}{x + 1} \leq 1 \Rightarrow \frac{-\varepsilon}{x + 1} \leq 0 \Rightarrow x \geq -\varepsilon$$

$$\Rightarrow D_f = \left\{ x \mid x = \frac{-\varepsilon}{x + 1}, 1 \in \mathbb{W} \right\}$$