

الف) $\frac{\cot x + 1}{\tan x + 1}$

$\tan x \neq -1 \Rightarrow \tan x \neq k\pi - \frac{\pi}{4}$

$D_f = \mathbb{R} - \{k\pi - \frac{\pi}{4}, \frac{k\pi}{2}\}$

$\tan x, \cot x$ undefined $\rightarrow x \neq \frac{k\pi}{2}$

ب) $1 - \sqrt{\sin^2 x} \geq 0$

$1 \geq \sqrt{\sin^2 x} \Rightarrow \frac{1}{\sqrt{2}} \geq \sin^2 x \rightarrow \frac{1}{2} \geq \sin^2 x \geq -\frac{1}{2}$

$D_f = [\sqrt{k\pi - \frac{\pi}{4}}, \sqrt{k\pi + \frac{\pi}{4}}] \cup [\sqrt{k\pi + \frac{3\pi}{4}}, \sqrt{k\pi + \frac{5\pi}{4}}]$

الف) $\sqrt{\sin x} - 1 \geq 0 \Rightarrow \sin x \geq \frac{1}{4} \rightarrow D_f = [\sqrt{k\pi + \frac{\pi}{4}}, \sqrt{k\pi + \frac{3\pi}{4}}]$

ب) $1 - \sqrt{\cos x} \geq 0 \Rightarrow \frac{1}{4} \geq \cos x \rightarrow D_f = [\sqrt{k\pi + \frac{\pi}{2}}, \sqrt{k\pi + \frac{3\pi}{2}}]$

الف) $1 \geq x^2 + \sqrt{x} + 1 \geq -1$

$0 \geq x^2 + \sqrt{x}$

$x^2 + \sqrt{x} + 1 \geq 0$

$0 \geq x(x + \sqrt{x})$

$(x+1)(x+\sqrt{x}) \geq 0$

$\frac{-\sqrt{x}}{+\phi - \phi+}$

$\frac{-1}{+\phi - \phi+}$

$\rightarrow D_f = (-\infty, -1] \cup [0, +\infty)$

ب) $1 \geq \sqrt{\omega - \sqrt{x}} \geq -1$

$1 \geq \sqrt{\omega - \sqrt{x}} \geq 0 \Rightarrow \omega - \sqrt{x} \geq 0 \Rightarrow -\sqrt{x} \geq -\omega \Rightarrow \sqrt{x} \leq \omega$

$D_f = [\sqrt{x}, \omega]$

الف) $1 - \log_{\sqrt{x}} x \geq 0$

$1 > \log_{\sqrt{x}} x \rightarrow \sqrt{x} > x > 0 \rightarrow D_f = (0, \sqrt{x})$

ب) $1 - \log_{\frac{x}{4}} x \geq 0$

$1 > \log_{\frac{x}{4}} x \Rightarrow x > \frac{1}{4} \Rightarrow D_f = (\frac{1}{4}, +\infty)$

الف) $\sqrt{x} - x^2 - 1 \geq 0$

$\sqrt{x} - x^2 \geq 1 \rightarrow 0 \geq x^2 - \sqrt{x} + 1 \rightarrow \frac{1}{+\phi - \phi+}$

$D_f = [1, \sqrt{x}]$

ب) $\frac{\sqrt{x} + \omega}{\sqrt{x} + \kappa} \in W$

$\Rightarrow \sqrt{x}W + \kappa W \in \omega W + \omega$

$\sqrt{x}W - \omega W \in \omega - \kappa W$

$x(\sqrt{W} - \omega) \in \omega - \kappa W$

$x \in \frac{\omega - \kappa W}{\sqrt{W} - \omega}$

$D_f = \{x \in \frac{\omega - \kappa W}{\sqrt{W} - \omega} \mid \kappa \in W\}$

$$y = \frac{x+w}{(\sqrt{x-1})(x+w)(x-1)} \quad (الف) \quad (-1)$$

$$D_f = \mathbb{R} \setminus \{1, -1\}$$

$$y = \frac{x+w}{(\sqrt{x+1})(x+w)(x+1)} \quad (ب)$$

$$D_f = \mathbb{R} \setminus \{-\frac{1}{\sqrt{e}}, -\sqrt{e}, -1\}$$

$$y = \frac{x+w}{(\sqrt{x^2-x+1})(x-1)} \quad (ج) \quad (-1)$$

$$D_f = \mathbb{R} \setminus \{1\}$$

$$y = \sqrt{\frac{x+w}{(x^2-x+1)(x-1)}} \quad \frac{-w}{+\phi} - \frac{1}{\sqrt{e}+}$$

$$D_f = (-\infty, -w] \cup (1, +\infty) \quad (د)$$

$$x > 1 \rightarrow y = \frac{v}{x^2 - \omega x + \omega^2 - \sqrt{x+1} + \omega} = \frac{v}{x^2 - \sqrt{x+1} + \omega} = \frac{v}{(x-\omega)(x-\sqrt{x+1})} \Rightarrow \frac{v}{+\frac{1}{\sqrt{e}} - \frac{1}{\sqrt{e}+}}$$

$$x < 1 \rightarrow y = \frac{v}{x^2 - \omega x + \omega^2 - \sqrt{x+1} + \omega} = \frac{v}{x^2 + \sqrt{x+1}} = \frac{v}{x(x+\sqrt{x+1})} \Rightarrow \frac{v}{+\frac{1}{\sqrt{e}} - \frac{1}{\sqrt{e}+}}$$

$$\rightarrow D_f = \mathbb{R} \setminus (0, \sqrt{e}) \cup (\omega, +\infty) \cup (-\infty, -w)$$

$$الف) [-x] - \sqrt{x} \geq 0 \rightarrow [-x] \geq \sqrt{x} \rightarrow x \leq -\sqrt{x} \rightarrow D_f = (-\infty, -\sqrt{e}] \quad (ك)$$

$$ب) [x]^2 - \sqrt{x} - w \neq 0$$

$$([x] - \sqrt{w})([x] + 1) \neq 0 \quad [x] \neq \sqrt{w}, -1 \Rightarrow D_f = \mathbb{R}$$

$$\rightarrow D_f = [\sqrt{e}, +\infty) \cup [0, \sqrt{e}) \cup (-\infty, -1)$$

$$ج) [x - \frac{1}{\sqrt{e}}] + [x + \frac{1}{\sqrt{e}}] \geq 0 \rightarrow [x - \frac{1}{\sqrt{e}}] + [x + \frac{1}{\sqrt{e}}] - 1 + 1 = [x - \frac{1}{\sqrt{e}}] + 1 \geq 0 \quad (ل)$$

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

$$[x - \frac{1}{\sqrt{e}}] + [\frac{1}{\sqrt{e}} - x] \geq 0 \rightarrow [x - \frac{1}{\sqrt{e}}] + [-(x - \frac{1}{\sqrt{e}})] \geq 0$$

$$\rightarrow D_f = \{k + \frac{1}{\sqrt{e}} \mid k \in \mathbb{Z}\}$$

$$[a] + [-a] \rightarrow \text{diagram showing integer values on a number line}$$