

ج) $y = \sqrt{\underbrace{\left[\frac{x-1}{4}\right]}_a + \underbrace{\left[\frac{1}{4} - x\right]}_{-a}} \Rightarrow [a] + [-a] \geq 0 \Rightarrow \begin{cases} a \in \mathbb{Z} \Rightarrow [a] + [-a] = 0 \Rightarrow \checkmark \Rightarrow x - \frac{1}{4} \in \mathbb{Z} \Rightarrow \\ a \notin \mathbb{Z} \Rightarrow [a] + [-a] = -1 \end{cases}$

$D_f = \left\{ x \mid x = k + \frac{1}{4}, k \in \mathbb{Z} \right\}$

الف) $y = \frac{\cot x + 1}{\tan x + 1} \Rightarrow \left. \begin{array}{l} \textcircled{1} \tan x \neq -1 \Rightarrow x \neq \frac{3\pi}{4}, \frac{7\pi}{4} \\ \textcircled{2} \sin x \neq 0 \Rightarrow x \neq k\pi, \pi \\ \textcircled{3} \cos x \neq 0 \Rightarrow x \neq \frac{\pi}{2}, \frac{3\pi}{2} \end{array} \right\} \Rightarrow D_f = \mathbb{R} - \left\{ \frac{k\pi}{4}, k\pi - \frac{\pi}{4} \right\}$

ج) $y = \sqrt{1 - \epsilon \sin^2 x} \Rightarrow 1 - \epsilon \sin^2 x \geq 0 \Rightarrow \sin^2 x \leq \frac{1}{\epsilon} \Rightarrow \frac{1}{\epsilon} \geq \sin^2 x \leq \frac{1}{\epsilon} \Rightarrow D_f = \left[k\pi - \frac{\pi}{\sqrt{\epsilon}}, k\pi + \frac{\pi}{\sqrt{\epsilon}} \right]$

الف) $y = \sqrt{2 \sin x - 1} \Rightarrow 2 \sin x - 1 \geq 0 \Rightarrow \sin x \geq \frac{1}{2} \Rightarrow D_f = \left[2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6} \right]$

ج) $y = \sqrt{1 - 2 \cos x} \Rightarrow 1 - 2 \cos x \geq 0 \Rightarrow \cos x \leq \frac{1}{2} \Rightarrow D_f = \left[2k\pi + \frac{\pi}{3}, 2k\pi - \frac{\pi}{3} \right]$

الف) $y = \arcsin(x^2 + 4x + 1) \Rightarrow -1 \leq x^2 + 4x + 1 \leq 1 \Rightarrow \left. \begin{array}{l} \textcircled{1} x^2 + 4x + 1 \leq 1 \Rightarrow x(x+4) \leq 0 \Rightarrow x \in [-4, 0] \\ \textcircled{2} x^2 + 4x + 1 \geq -1 \Rightarrow x^2 + 4x + 2 \geq 0 \Rightarrow x \in (-\infty, -2] \cup [1, \infty) \end{array} \right\} \Rightarrow D_f = [-4, -2] \cup [1, 0]$

ج) $\cos y = \sqrt{a - 2x} \Rightarrow \left. \begin{array}{l} \textcircled{1} a - 2x \geq 0 \Rightarrow x \leq \frac{a}{2} \\ \textcircled{2} -1 \leq \sqrt{a - 2x} \leq 1 \Rightarrow \begin{cases} \textcircled{2.1} a - 2x \leq 1 \Rightarrow x \geq \frac{a-1}{2} \\ \textcircled{2.2} a - 2x \geq 1 \Rightarrow x \leq \frac{a-1}{2} \end{cases} \end{array} \right\} \Rightarrow D_f = \left[\frac{a-1}{2}, \frac{a}{2} \right]$

معمولاً به این صورت است

الف) $y = \log_2(1 - \log_3 x) \Rightarrow \left. \begin{array}{l} \textcircled{1} x > 0 \\ \textcircled{2} 1 - \log_3 x > 0 \Rightarrow \log_3 x < 1 \Rightarrow x < 3 \end{array} \right\} \Rightarrow D_f = (0, 3)$

ج) $y = \log_2\left(1 - \log_3 \frac{x}{4}\right) \Rightarrow \left. \begin{array}{l} \textcircled{1} x > 0 \\ \textcircled{2} 1 - \log_3 \frac{x}{4} > 0 \Rightarrow \log_3 \frac{x}{4} < 1 \Rightarrow \frac{x}{4} < 3 \Rightarrow x < 12 \end{array} \right\} \Rightarrow D_f = \left(\frac{1}{4}, 12 \right)$

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

$\frac{1}{x-2} \Rightarrow D_f = [1, 3]$

ج) $y = \left(\frac{x^2 + \omega}{x^2 + \epsilon} \right)! \Rightarrow \frac{x^2 + \omega}{x^2 + \epsilon} \in \mathbb{W} \Rightarrow D_f = \left\{ x \mid x = \frac{\epsilon k + \omega}{k - \epsilon}, k \in \mathbb{W} \right\}$