

الف) $y = \frac{\sin x - 1}{\cos x + 1}$ $\int \dots$ $\cos x + 1 \neq 0 \Rightarrow \cos x \neq -1 \Rightarrow \cos x \neq -\frac{1}{1} \Rightarrow D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{2}, k\pi + \frac{3\pi}{2} \right\}$

ب) $y = \frac{\sinh x + 1}{\cosh x - 1}$ $\int \dots$ $\cosh x - 1 \neq 0 \Rightarrow \cosh x \neq 1 \Rightarrow D_f = \mathbb{R} - \{ k\pi \}$

الف) $y = \frac{1 \sin x + 1}{\tan x + 1}$ $\int \dots$ $\tan x + 1 \neq 0 \Rightarrow \tan x \neq -1 \Rightarrow D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{4}, k\pi + \frac{5\pi}{4} \right\}$

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

الف) $\sin y = x^2 - 1 \Rightarrow 1 \geq x^2 - 1 \geq -1 \Rightarrow 2 \geq x^2 \geq 0 \Rightarrow -\sqrt{2} \leq x \leq \sqrt{2} \Rightarrow x \in [-\sqrt{2}, \sqrt{2}] \cup [1, 2]$

ب) $y = \arccos(\sqrt{x - 3}) \Rightarrow 1 \geq \sqrt{x - 3} \geq -1 \Rightarrow 1 \geq \sqrt{x} \geq 0 \Rightarrow 1 \geq x \geq 0 \Rightarrow x \in [0, 1]$

الف) $\cos y = |x| - 3$ $1 \geq |x| - 3 \geq -1 \Rightarrow 4 \geq |x| \geq 2 \Rightarrow 2 \leq x \leq 4 \cup -4 \leq x \leq -2 \Rightarrow D_f = [2, 4] \cup [-4, -2]$

ب) $y = \arcsinh(x^2 + 3x + 1) \Rightarrow 1 \geq x^2 + 3x + 1 \geq -1 \Rightarrow 0 \geq x(x + 3) \geq -2 \Rightarrow D_f = [-3, 0]$

الف) $y = \log_{10} x^2 - 4$ $\int \dots$ $x^2 - 4 > 0 \Rightarrow x^2 > 4 \Rightarrow x > 2, x < -2 \Rightarrow D_f = (2, +\infty) \cup (-\infty, -2)$

ب) $y = \log_{10} x - 1$ $\int \dots$ $x - 1 > 0 \Rightarrow x > 1 \Rightarrow D_f = (1, +\infty)$

الف) $y = \log_{10} x^2 - 1$ $\int \dots$ $x^2 - 1 > 0 \Rightarrow x^2 > 1 \Rightarrow x < -1 \cup x > 1 \Rightarrow D_f = (-\infty, -1) \cup (1, +\infty)$

$$\text{الف) } y = \log \frac{x^2 - 4x + 3}{x - 3} = \log \frac{(x-3)(x-1)}{x-3} = \log (x-1) \Rightarrow x > 1$$

$$D_f = (1, +\infty) - \{3\}$$

$$\text{ب) } y = \log \frac{x+3}{x-1} \Rightarrow x < -3, x > 1 \quad \left. \begin{array}{l} x+3 > 0 \Rightarrow x > -3, x+3 \neq 1, x \neq -4 \end{array} \right\} D_f = (-\infty, -3) \cup (1, +\infty) - \{-4\}$$

$$\text{الف) } y = \sqrt{2 - \log_2(x-1)} \Rightarrow x-1 > 0 \Rightarrow x > 1 \quad (I)$$

$$D_f = (I) \cap (II) = (2, 10]$$

$$\text{ب) } y = \log(2 \log_2 \frac{x}{\sqrt{2}} - 1) \Rightarrow x > 0 \quad (I)$$

$$D_f = (I) \cup (II) = (\sqrt{2}, +\infty)$$

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

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

$$\text{ج) } y = \frac{2}{2^x - 2} \Rightarrow 2^x - 2 \neq 0 \Rightarrow 2^x \neq 2 \Rightarrow x \neq \log_2 2 \Rightarrow D_f = \mathbb{R} - \{1\}$$

$$\text{د) } y = \frac{2}{2^x - 3} \Rightarrow 2^x - 3 \neq 0 \Rightarrow 2^x \neq 3 \Rightarrow x \neq \log_2 3 \Rightarrow D_f = \mathbb{R} - \{\log_2 3\}$$

$$\text{الف) } y = (2x+1)! \Rightarrow 2x+1 \in \mathbb{N} \Rightarrow 2x \in \mathbb{N} - 1 \Rightarrow x \in \frac{\mathbb{N}-1}{2} \Rightarrow D_f = \{x / x \in \frac{k-1}{2}, k \in \mathbb{N}\}$$

$$\text{ب) } y = \left(\frac{2x-1}{2x-3} \right)! \Rightarrow \frac{2x-1}{2x-3} \in \mathbb{N} \Rightarrow 2x-1 \in (2x-3)\mathbb{N} \Rightarrow 2x-1 \in 2x\mathbb{N} - 3\mathbb{N} \Rightarrow 2x-1 \in 2x\mathbb{N} - 3\mathbb{N}$$

$$\Rightarrow x \in \frac{1-3\mathbb{N}}{2-2\mathbb{N}} \Rightarrow D_f = \{x / x \in \frac{1-3k}{2-2k}, k \in \mathbb{N}\}$$