

الف) $y = \frac{\sin x - 2}{2 \cos x + 1} \Rightarrow 2 \cos x + 1 \neq 0 \Rightarrow \cos x \neq -\frac{1}{2}$
 $\Rightarrow D = \mathbb{R} - \left\{ k\pi + \frac{2\pi}{3}, k\pi + \frac{4\pi}{3} \right\}$

ب) $y = \frac{\sin x + 2}{\cos x - 1} \Rightarrow \cos x - 1 \neq 0 \Rightarrow \cos x \neq 1$
 $\Rightarrow D = \mathbb{R} - \{ 2k\pi \}$

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

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

الف) $\sin y = x^2 - 2 \Rightarrow -1 \leq x^2 - 2 \leq 1 \Rightarrow 1 \leq x^2 \leq 3 \Rightarrow 1 \leq |x| \leq \sqrt{3}$
 $\Rightarrow D = [-\sqrt{3}, -1] \cup [1, \sqrt{3}]$

ب) $\arccos(\sqrt{x} - 3) \Rightarrow -1 \leq \sqrt{x} - 3 \leq 1 \Rightarrow 2 \leq \sqrt{x} \leq 4 \Rightarrow 4 \leq x \leq 16$
 $\Rightarrow D = [4, 16]$

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

الف) $\arcsin(x^2 + 3x + 1) \Rightarrow -1 \leq x^2 + 3x + 1 \leq 1 \Rightarrow -2 \leq x(x+3) \leq 0$
 $\Rightarrow D = [-2, 0]$

الف) $y = \log_2 x^2 - 4 \Rightarrow x^2 - 4 > 0 \Rightarrow x^2 > 4 \Rightarrow |x| > 2 \Rightarrow D = \mathbb{R} - [-2, 2]$

ب) $y = \log_2 2 - |x| \Rightarrow 2 - |x| > 0 \Rightarrow 2 > |x| \Rightarrow D = (-2, 2)$

(الف) $y = \log \frac{\delta - \alpha}{\alpha_2 - \alpha}$ $\left\{ \begin{array}{l} \delta - \alpha > 0 \\ \alpha_2 - \alpha > 0 \\ \alpha_2 - \alpha \neq 1 \end{array} \right\} \Rightarrow \left. \begin{array}{l} \delta > \alpha \\ \alpha_2 > \alpha \\ \alpha_2 \neq 1 \end{array} \right\} \Rightarrow D = (\alpha, \delta) - \{1\}$

$\Rightarrow y = \log a^x - 1$
 $x + y$
 $\left. \begin{aligned} &\rightarrow a^x - 1 > 0 \\ &\rightarrow x + y > 0 \\ &\rightarrow x + y \neq 1 \end{aligned} \right\} \Rightarrow \left. \begin{aligned} &a^x > 1 \Rightarrow |x| > 1 \\ &x > -y \\ &x \neq -y \end{aligned} \right\} \Rightarrow D = (-\infty, -1) \cup (1, \infty) \setminus \{-1, 1\}$
 $(-2, -1) \cup (1, \infty) \setminus \{-1, 1\}$

$$\text{اقل) } y = \log \frac{x^2 - 4x + 3}{x - 2} \Rightarrow \frac{(x-2)(x-1)}{x-2} > 0$$

$$\Rightarrow \frac{1}{-\phi} + \frac{1}{\phi} \Rightarrow D = (1, 2) \cup (2, +\infty)$$

$$\text{b.) } y = \log \frac{x+w}{x-v} \quad \left\{ \begin{array}{l} \frac{x+w}{x-v} > 0 \Rightarrow \frac{-w}{+ \infty - \frac{v}{0+}} \\ x + \delta > 0 \Rightarrow x > -\delta \\ x + \delta \neq 1 \Rightarrow x \neq -\delta \end{array} \right\} \Rightarrow D = \left\{ (-\delta, -w) \cup (v, +\infty) \right\} - \left\{ -\frac{v}{\delta} \right\}$$

(الف) $y = \sqrt{x - \log_y(x-y)}$

$\Rightarrow x - y > 0 \Rightarrow x > y$
 $\Rightarrow x - \log_y(x-y) > 0 \Rightarrow \log_y(x-y) < x - y$
 $\Rightarrow x - y < 1 \Rightarrow x < 1 + y \Rightarrow D = (y, 1+y]$
 $x > 0$

$$\Rightarrow D = (\sqrt{r} + \infty)$$

الف) $y = \frac{w}{e^x + 1} \rightarrow e^x + 1 \neq 0 \Rightarrow e^x \neq -1 \Rightarrow D = \mathbb{R}$

ج) $y = \frac{r}{e^x - 1} \rightarrow e^x - 1 \neq 0 \Rightarrow e^x \neq 1 \Rightarrow D = \mathbb{R} - \{0\}$

2.) $y = \frac{x}{x-1} \rightarrow x \neq 1 \Rightarrow x \neq \log 1 \Rightarrow D = \mathbb{R} - \{1\}$

c) $\frac{y}{x-y} \rightarrow x \neq y \Rightarrow x \neq \log_g y \Rightarrow D = \mathbb{R} - \{\log_g y\}$

2) $y = (x+1)!$ $\rightarrow x+1 \in W \Rightarrow x \in W-1$
 $\Rightarrow D = \{x \mid x = \frac{k-1}{2}, k \in W\}$

$$\Rightarrow D = \left\{ x \mid x = \frac{\partial k - r}{-r k + w} \text{ } \forall k \in W \right\}$$