

الف)  $y = \frac{\sin x - 2}{2 \cos x + 1}$   $2 \cos x + 1 \neq 0$   $2 \cos x \neq -1$   $\cos x \neq -\frac{1}{2}$

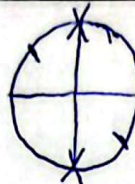


$D_f = \mathbb{R} - \left\{ 2k\pi \pm \frac{2\pi}{3} \right\}$

ب)  $y = \frac{\sin x + 3}{\cos x - 1}$   $\cos x - 1 \neq 0$   $\cos x \neq 1$   $D_f = \mathbb{R} - \{2k\pi\}$



الف)  $y = \frac{2 \sin x + 1}{\tan x + 1}$   $\tan x + 1 \neq 0$   $\tan x \neq -1$



$D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{4}, k\pi - \frac{\pi}{4} \right\}$

ب)  $y = \frac{\cos x + 1}{\cot x - 1}$   $\cot x - 1 \neq 0$   $\cot x \neq 1$



$D_f = \mathbb{R} - \left\{ k\pi, k\pi + \frac{\pi}{4} \right\}$

الف)  $\sin y = x^2 - 2$   $-1 \leq x^2 - 2 \leq 1$   $1 \leq x^2 \leq 3$

$x^2 \geq 1 \rightarrow x \geq 1$   $x \leq -1$   $x^2 \leq 3 \rightarrow -\sqrt{3} \leq x \leq \sqrt{3}$   $D_f = [-\sqrt{3}, -1] \cup [1, \sqrt{3}]$

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

الف)  $\cos y = |x| - 3$   $-1 \leq |x| - 3 \leq 1$   $2 \leq |x| \leq 4$

$|x| \geq 2 \rightarrow x \geq 2$   $x \leq -2$   $|x| \leq 4 \rightarrow -4 \leq x \leq 4$   $D_f = [-4, -2] \cup [2, 4]$

ب)  $y = \arcsin(x^2 + 3x + 1)$   $-1 \leq x^2 + 3x + 1 \leq 1$   $-2 \leq x^2 + 3x \leq 0$   $x^2 + 3x \leq 0$   $x(x+3) \leq 0$   $D_f = [-3, -2] \cup [-1, 0]$

الف)  $y = \log_3 x^{2-3}$   $x^{2-3} > 0$   $x^2 > 3 \rightarrow x > \sqrt{3}$   $x < -\sqrt{3}$

$D_f = (-\infty, -\sqrt{3}) \cup (\sqrt{3}, \infty)$

ب)  $y = \log_3 \frac{2-|x|}{x}$   $2-|x| > 0$   $|x| < 2 \rightarrow -2 < x < 2$

$D_f = (-2, 2)$

$$\text{الف) } y = \log_{x-3}^{\delta-x} \quad \delta-x > 0 \quad x-3 > 0 \quad x-3 \neq 1 \quad D_f = (3, \delta) - \{4\}$$

$$x < \delta \quad x > 3 \quad x \neq 4$$

$$\text{ب) } y = \log_{x+3}^{x^2-1} \quad x^2-1 > 0 \quad x+3 > 0 \quad x+3 \neq 1$$

$$x^2 > 1 \rightarrow x > 1 \quad x > -3 \quad x \neq -2$$

$$x < -1 \quad D_f = (-3, -1) - \{-2\}$$

$$\text{الف) } y = \log \frac{x^2-5x+3}{x-3} \quad x-3 \neq 0 \quad \frac{x^2-5x+3}{x-3} > 0 \rightarrow \frac{x^2-5x+3}{(x-1)(x-3)} > 0$$

$$D_f = (-\infty, 1) \cup (3, \infty)$$

$$\text{ب) } y = \log \frac{x+3}{x-3} \quad x+3 > 0 \quad x-3 > 0 \quad x+3 \neq 1 \quad x \neq -4$$

$$D_f = (-3, -1) \cup (3, \infty) - \{-4\}$$

$$\text{الف) } y = \sqrt{3 - \log_y(x-1)} \quad x-1 > 0 \quad 3 - \log_y(x-1) \geq 0$$

$$x > 1 \quad \log_y(x-1) \leq 3 \quad x-1 \leq 1 \quad x \leq 4$$

$$D_f = (1, 4]$$

$$\text{ب) } y = \log(\sqrt[3]{\log_x^x - 1}) \quad \sqrt[3]{\log_x^x - 1} > 0 \quad \sqrt[3]{\log_x^x} > 1 \quad \log_x^x > \frac{1}{x}$$

$$x > \sqrt{x}$$

$$D_f = (\sqrt{x}, \infty)$$

$$\text{الف) } y = \frac{x}{x+1} \quad x+1 \neq 0 \quad D_f = \mathbb{R}$$

$$x \neq -1$$

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

$$x \neq 1$$

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

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

$$\text{الف) } y = (x+1)! \quad x+1 \in \mathbb{W} \quad x \in \mathbb{W}-1 \quad x \in \frac{\mathbb{W}-1}{x}$$

$$D_f = \{x \mid x = \frac{k-1}{x}, k \in \mathbb{W}\}$$

$$\text{ب) } y = \left(\frac{x^2-1}{x^2-3}\right)! \quad \frac{x^2-1}{x^2-3} \in \mathbb{W} \quad x = -\frac{-\delta W + 1}{x W - 3} = \frac{\delta W - 1}{x W - 3}$$

$$D_f = \{x \mid x = \frac{\delta k - 1}{x k - 3}, k \in \mathbb{W}\}$$