

$\left\{ \begin{array}{l} \text{الف) } 2 \cos x \neq -1 \rightarrow \cos x \neq -\frac{1}{2} \quad D_f = \mathbb{R} - \left\{ 2k\pi + \frac{2\pi}{3}, 2k\pi + \frac{4\pi}{3} \right\} \\ \text{ب) } \cos x \neq 1 \rightarrow D_f = \mathbb{R} - \{ 2k\pi \} \end{array} \right.$

الناسياني

$\left\{ \begin{array}{l} \text{الف) } \tan x \neq -1 \\ \cos x \neq 0 \end{array} \right. \Rightarrow D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{4}, k\pi + \frac{5\pi}{4} \right\}$

$\left\{ \begin{array}{l} \text{ب) } \cot x \neq 1 \\ \sin x \neq 0 \end{array} \right. \Rightarrow D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{4}, k\pi \right\}$

$\left\{ \begin{array}{l} \text{الف) } -1 \leq x^2 - 2 \leq 1 \Rightarrow x^2 - 2 \leq 1 \rightarrow x^2 \leq 3 \rightarrow -\sqrt{3} \leq x \leq \sqrt{3} \\ x^2 - 2 \geq -1 \rightarrow x^2 \geq 1 \rightarrow x \geq 1 \text{ or } x \leq -1 \end{array} \right.$

$D_f = [-\sqrt{3}, -1] \cup [1, \sqrt{3}]$

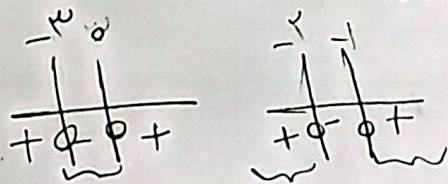
$\left\{ \begin{array}{l} \text{ب) } -1 \leq \sqrt{x} - 3 \leq 1 \Rightarrow \sqrt{x} - 3 \leq 1 \rightarrow \sqrt{x} \leq 4 \rightarrow x \leq 16 \\ \sqrt{x} - 3 \geq -1 \rightarrow \sqrt{x} \geq 2 \rightarrow x \geq 4 \end{array} \right.$

$D_f = [4, 16]$

$\left\{ \begin{array}{l} \text{الف) } -1 \leq |x| - 3 \leq 1 \Rightarrow |x| - 3 \leq 1 \rightarrow |x| \leq 4 \rightarrow -4 \leq x \leq 4 \\ |x| - 3 \geq -1 \rightarrow |x| \geq 2 \rightarrow x \geq 2 \text{ or } x \leq -2 \end{array} \right.$

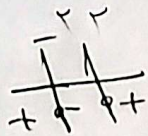
$D_f = [-4, -2] \cup [2, 4]$

$\left\{ \begin{array}{l} \text{ب) } -1 \leq x^2 + 3x + 1 \leq 1 \Rightarrow x^2 + 3x + 1 \leq 1 \rightarrow x^2 + 3x \leq 0 \\ x^2 + 3x + 1 \geq -1 \rightarrow x^2 + 3x + 2 \geq 0 \end{array} \right.$



$D_f = [-3, -2] \cup [-1, 0]$

$\left\{ \begin{array}{l} \text{الف) } (x-2)(x+2) > 0 \end{array} \right.$



$D_f = (-\infty, -2) \cup (2, +\infty)$

$\left\{ \begin{array}{l} \text{ب) } 2 - |x| > 0 \rightarrow |x| < 2 \rightarrow x < 2 \text{ or } x > -2 \end{array} \right.$

$D_f = (-2, 2)$

$$\left\{ \begin{array}{l} \text{الف) } x-1 > 0 \rightarrow x < 0 \\ x-3 > 0 \rightarrow x > 3 \\ x-3 \neq 1 \rightarrow x \neq 4 \end{array} \right.$$

$$D_f = (3, 0) - \{4\}$$

-4

ⓧ

$$\text{ب) } (x-1)(x+1) > 0$$

$$\begin{array}{c|c|c} -1 & & 1 \\ \hline + & - & + \end{array}$$

$$\begin{array}{l} x+3 > 0 \rightarrow x > -3 \\ x+3 \neq 1 \rightarrow x \neq -2 \end{array}$$

$$D_f = (-3, -2) \cup (-2, -1) \cup (1, +\infty)$$

-4

$$\left\{ \begin{array}{l} \text{الف) } \frac{(x-3)(x-1)}{x-3} \rightarrow x \neq 3 \\ x-1 > 0 \rightarrow x > 1 \end{array} \right.$$

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

ⓧ

$$\left\{ \begin{array}{l} \text{ب) } \frac{x+3}{x-2} > 0 \rightarrow \end{array} \right.$$

$$\begin{array}{c|c|c} -3 & & 2 \\ \hline + & - & + \end{array}$$

$$x+3 > 0 \rightarrow x > -3$$

$$D_f = (-3, 2) \cup (2, +\infty) - \{-2\}$$

ⓧ

$$\left\{ \begin{array}{l} \text{الف) } x-2 > 0 \\ x > 2 \end{array} \right.$$

$$3 - \log_2 x > 0$$

$$\log_2 x \leq 3 \rightarrow x-2 \leq 1$$

$$D_f = (2, 10]$$

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

-4

$$2 \log_2 x - 1 > 0 \rightarrow 2 \log_2 x > 1 \rightarrow \log_2 x > \frac{1}{2} \rightarrow x > \sqrt{2}$$

ⓧ

$$\left\{ \begin{array}{l} \text{الف) } x^a \neq 1 \end{array} \right. \quad D_f = \mathbb{R}$$

$$\text{ب) } x^a \neq 1 \\ x \neq 0$$

$$D_f = \mathbb{R} - \{0\}$$

$$\left\{ \begin{array}{l} \text{ج) } x^a \neq 2 \\ x \neq \frac{1}{2} \end{array} \right. \quad D_f = \mathbb{R} - \left\{ \frac{1}{2} \right\}$$

$$\text{د) } x^a \neq 3$$

$$x \neq \log_2 3 \quad D_f = \mathbb{R} - \left\{ \log_2 3 \right\}$$

$$\text{الف) } \leftarrow x+1 \in \omega$$

$$\leftarrow x \in \omega+1 \rightarrow x \in \frac{\omega-1}{k}$$

$$D_f = \{x \mid x = \frac{k+1}{k}, k \in \omega\} \quad \text{1✓}$$

$$\text{ب) } \frac{\omega x - 1}{\omega - 0} \in \omega \rightarrow x = \frac{\omega \omega - 1}{\omega - \omega}$$

$$D_f = \{x \mid x = \frac{\omega k - 1}{k \omega - 1}, k \in \omega\} \quad \text{✓}$$