

الف) $y = \sqrt{4-x}$ → $\begin{cases} 4-x \geq 0 \rightarrow x \leq 4 \\ \sqrt{4-x} \geq 0 \rightarrow x \leq 4 \end{cases}$ → $x \leq 4$ → $x \geq -4$
 $D_f = [-4, 4]$

ب) $y = \sqrt{3-x-2}$ → $\begin{cases} 3-x-2 \geq 0 \rightarrow 1-x \geq 0 \rightarrow x \leq 1 \\ \sqrt{3-x-2} \geq 0 \rightarrow x \leq 1 \end{cases}$ → $x \leq 1$
 $D_f = [1, 11]$

الف) $y = \sqrt{4-2x^2}$ → $4-2x^2 \geq 0 \rightarrow 2x^2 \leq 4 \rightarrow x^2 \leq 2 \rightarrow -\sqrt{2} \leq x \leq \sqrt{2}$
 $D_f = (-\sqrt{2}, \sqrt{2})$

ب) $y = \sqrt{3|x|-9}$ → $3|x|-9 \geq 0 \rightarrow 3|x| \geq 9 \rightarrow |x| \geq 3 \rightarrow x \leq -3 \text{ or } x \geq 3$
 $D_f = (-\infty, -3] \cup [3, \infty)$

الف) $y = \sqrt[3]{\frac{|x|+1}{|x|-3}}$ → $|x|-3 \neq 0 \rightarrow |x| \neq 3 \rightarrow x \neq \pm 3$
 $D_f = \mathbb{R} - \{\pm 3\}$

ب) $y = \sqrt[3]{\frac{\sqrt{x}+1}{\sqrt{x}-3}}$ → $\begin{cases} \sqrt{x}-3 \neq 0 \rightarrow \sqrt{x} \neq 3 \rightarrow x \neq 9 \\ \sqrt{x} \geq 0 \rightarrow x \geq 0 \end{cases}$ → $D_f = [0, \infty) - \{9\}$

الف) $y = \frac{\sqrt{3-|x|}}{|x|+2}$ → $\begin{cases} 3-|x| \geq 0 \rightarrow |x| \leq 3 \rightarrow -3 \leq x \leq 3 \\ |x|+2 \neq 0 \rightarrow |x| \neq -2 \end{cases}$ → $D_f = [-3, 3]$

ب) $y = \frac{\sqrt{4-x^2}}{|x|-1}$ → $\begin{cases} 4-x^2 \geq 0 \rightarrow x^2 \leq 4 \rightarrow -2 \leq x \leq 2 \\ |x|-1 \neq 0 \rightarrow |x| \neq 1 \rightarrow x \neq \pm 1 \end{cases}$ → $D_f = [-2, 2] - \{\pm 1\}$

الف) $y = \frac{x+1}{\sqrt{x+|x|}}$ → $x+|x| > 0$ → $D_f = \mathbb{R}^+$

ب) $y = \frac{1}{\sqrt{x+|x|}}$ → $x+|x| > 0$ → $D_f = \mathbb{R}^+$

$$\text{الف) } y = \sqrt{2-x} \rightarrow 2-x \geq 0 \rightarrow [x] \leq 2 \rightarrow x < 2 \rightarrow D_f = (-\infty, 2)$$

۲ ✓

$$\text{ب) } y = \frac{1}{\sqrt{2-x}} \rightarrow 2-x > 0 \rightarrow [x] < 2 \rightarrow x < 2 \rightarrow D_f = (-\infty, 2)$$

۶

$$\text{الف) } y = \frac{1}{x[x]} \rightarrow x[x] \neq 0 \rightarrow x \neq 0 \rightarrow D_f = \mathbb{R} - \{0\}$$

x و $[x]$ هم علامت

R- {0}

۱/۵

$$\text{ب) } y = \frac{1}{\sqrt{-x[x]}} \rightarrow -x[x] > 0 \rightarrow x[x] < 0 \rightarrow D_f = \emptyset$$

مربعشون هیچ وقت مثبت نمیشه

۷

$$\text{الف) } y = \sqrt{\left[x - \frac{1}{x}\right] + \left[x + \frac{1}{x}\right]} \rightarrow \left[x - \frac{1}{x}\right] + \left[x + \frac{1}{x}\right] \geq 0 \rightarrow \left[x - \frac{1}{x}\right] + \left[x - \frac{1}{x} + 1\right] \geq 0$$

$$\rightarrow \left[x - \frac{1}{x}\right] + 1 + \left[x - \frac{1}{x}\right] \geq 0 \rightarrow 2\left[x - \frac{1}{x}\right] \geq -1 \rightarrow \left[x - \frac{1}{x}\right] \geq -\frac{1}{2} \rightarrow x - \frac{1}{x} \geq -\frac{1}{2} \rightarrow x \geq \frac{1}{x} - \frac{1}{2}$$

$$D_f = \left[\frac{1}{x} - \frac{1}{2}, \infty\right)$$

$$\text{ب) } y = \sqrt{\left[x - \frac{1}{x}\right] + \left[-x + \frac{1}{x}\right]} \rightarrow \sqrt{\left[x - \frac{1}{x}\right] + \left[-\left(x - \frac{1}{x}\right)\right]} \rightarrow x - \frac{1}{x} \in \mathbb{Z}$$

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

۱/۷

۸

$$\text{الف) } y = \frac{1}{\sqrt{\sin^2 x - 1}} \rightarrow \sqrt{\sin^2 x - 1} \neq 0 \rightarrow \sin^2 x \neq \frac{1}{4} \rightarrow \sin x \neq \pm \frac{1}{2}$$

$$\sin x \neq \pm \frac{\sqrt{3}}{2}$$

$$D = \mathbb{R} - \left\{k\pi \pm \frac{\pi}{6}\right\}$$

$$\text{ب) } y = \frac{\cot x + 1}{\tan x + 1} = \frac{\frac{\cos x}{\sin x} + 1}{\frac{\sin x}{\cos x} + 1} \Rightarrow \begin{cases} \sin x \neq 0 \rightarrow x \neq k\pi \\ \cos x \neq -1 \rightarrow x \neq k\pi + \pi \end{cases}$$

$$D_f = \mathbb{R} - \left\{k\pi, k\pi + \frac{\pi}{2}\right\}$$

۱/۵



۹

$$\text{الف) } y = \sqrt{\sin x - 1} \rightarrow \sin x - 1 \geq 0 \rightarrow \sin x \geq \frac{1}{4} \rightarrow y \geq \frac{1}{4}$$

$$D_f = \left[2k\pi + \frac{\pi}{4}, 2k\pi + \pi - \frac{\pi}{4}\right]$$

۲ ✓

$$\text{ب) } y = \sqrt{1 - \cos x} \rightarrow 1 - \cos x \geq 0 \rightarrow \cos x \leq 1 \rightarrow \cos x \leq \frac{1}{4} \rightarrow x \geq \frac{\pi}{4}$$

$$D_f = \mathbb{R} - \left(2k\pi - \frac{\pi}{4}, 2k\pi + \frac{\pi}{4}\right) \cup D_f = \left[2k\pi + \frac{\pi}{4}, 2k\pi + \frac{3\pi}{4}\right]$$



۱۰