

الف) $y = \sqrt{4 - \sqrt{2-x}}$ $\begin{cases} 4-x \geq 0 \rightarrow x \leq 4 \\ 4-\sqrt{2-x} \geq 0 \rightarrow 4 \geq \sqrt{2-x} \rightarrow 4 \geq 2-x \rightarrow x \geq -2 \end{cases} \rightarrow D = [-2, 4]$

ب) $y = \sqrt{3 - \sqrt{x-2}}$ $\begin{cases} x-2 \geq 0 \rightarrow x \geq 2 \\ 3-\sqrt{x-2} \geq 0 \rightarrow \sqrt{x-2} \leq 3 \rightarrow x-2 \leq 9 \rightarrow x \leq 11 \end{cases} \rightarrow D = [2, 11]$

الف) $y = \sqrt{4 - 2x^2}$ $\rightarrow 4 - 2x^2 \geq 0 \rightarrow 2 \geq x^2 \rightarrow \sqrt{2} \geq |x| \rightarrow D = (-\sqrt{2}, \sqrt{2}]$

ب) $y = \sqrt{3|x|-9}$ $\rightarrow 3|x|-9 \geq 0 \rightarrow 3|x| \geq 9 \rightarrow |x| \geq 3 \rightarrow D = (-\infty, -3] \cup [3, +\infty)$

الف) $y = \frac{\sqrt{|x|+1}}{|x|-3}$ $\rightarrow |x| \neq 3 \rightarrow x \neq \pm 3 \rightarrow D = \mathbb{R} - \{\pm 3\}$

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

الف) $y = \frac{\sqrt{3-2x}}{|x|+2}$ $\begin{cases} 3-2x \geq 0 \rightarrow x \leq 1.5 \\ |x|+2 \neq 0 \rightarrow |x| \neq -2 \end{cases} \rightarrow D = [-1.5, 1.5]$

ب) $y = \frac{\sqrt{4-x^2}}{|x|-1}$ $\begin{cases} 4-x^2 \geq 0 \rightarrow -2 \leq x \leq 2 \\ |x|-1 \neq 0 \rightarrow |x| \neq 1 \end{cases} \rightarrow D = (-2, -1) \cup (1, 2]$

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

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

الف) $y = \sqrt{1-x} \rightarrow 1-x \geq 0 \rightarrow 1 \geq x \rightarrow x < \infty \rightarrow D = (-\infty, 1)$

(✓) ✓

ب) $y = \frac{1}{\sqrt{1-x}} \rightarrow 1-x > 0 \rightarrow 1 > x \rightarrow 1 > x \rightarrow D = (-\infty, 1)$

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

(1, 1.5)

ب) $y = \frac{1}{\sqrt{-x[x]}}$ $\rightarrow -x[x] > 0 \rightarrow D = \emptyset$ $\because$
 $\begin{matrix} \oplus x \\ \oplus x \\ \ominus x \end{matrix}$

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

$D = \left[\frac{1}{2}, +\infty\right)$ $\left\{ \begin{matrix} \left[x + \frac{1}{x}\right] - 1 + \left[x + \frac{1}{x}\right] \geq 0 \rightarrow 2\left[x + \frac{1}{x}\right] \geq 1 \rightarrow \left[x + \frac{1}{x}\right] \geq \frac{1}{2} \rightarrow x + \frac{1}{x} \geq 1 \rightarrow x \geq \frac{1}{2} \end{matrix} \right.$

ب) $\sqrt{\left[x - \frac{1}{x}\right] + \left[-x + \frac{1}{x}\right]} \rightarrow \begin{cases} a \in \mathbb{Z} & [a] + [-a] = 0 \\ a \notin \mathbb{Z} & [a] + [-a] = -1 \end{cases} \rightarrow x - \frac{1}{x} \in \mathbb{Z} \rightarrow x \in \mathbb{Z} + \frac{1}{x}!$
 $D = \{x | x = k + \frac{1}{x}, k \in \mathbb{Z}\}$

الف) $y = \frac{1}{1 - \sin^2 x}$ $\sin^2 x \neq 1 \rightarrow \sin^2 x \neq \frac{1}{1} \rightarrow \sin x \neq \pm \frac{\sqrt{1}}{1} \rightarrow D = \mathbb{R} - \left\{ \frac{k\pi}{2} + \frac{\pi}{2}, \frac{k\pi}{2} - \frac{\pi}{2} \right\}$

(1, 1.5)



ب) $y = \frac{\cot x + 1}{\tan x + 1} \rightarrow \begin{matrix} \tan x + 1 \neq 0 \rightarrow \tan x \neq -1 \\ \cos x \neq 0 \\ \sin x \neq 0 \end{matrix} \Rightarrow D = \mathbb{R} - \left\{ \frac{k\pi}{2} + \frac{\pi}{2}, \frac{k\pi}{2} - \frac{\pi}{2} \right\}$



الف) $y = \sqrt{1 - \sin^2 x}$ $\rightarrow 1 - \sin^2 x \geq 0 \rightarrow 1 - \sin^2 x \geq 0 \rightarrow \sin^2 x \leq 1 \rightarrow D = \left[\frac{k\pi}{2} + \frac{\pi}{2}, \frac{k\pi}{2} + \frac{3\pi}{2} \right]$

(✓) ✓



ب) $y = \sqrt{1 - \cos^2 x} \rightarrow 1 - \cos^2 x \geq 0 \rightarrow 1 - \cos^2 x \geq 0 \rightarrow \frac{1}{1} \geq \cos^2 x \rightarrow D = \left[\frac{k\pi}{2} + \frac{\pi}{2}, \frac{k\pi}{2} + \frac{3\pi}{2} \right]$

