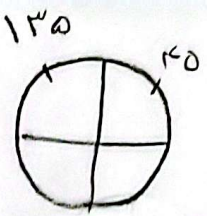


الف) $y = \frac{1}{\sqrt{\sin^2 x - 1}}$

$\sqrt{\sin^2 x - 1} \neq 0 \rightarrow \sqrt{\sin^2 x} \neq 1 \rightarrow \sin^2 x \neq \frac{1}{4} \rightarrow \sin x \neq \pm \frac{1}{2}$
 $\sin x \neq \frac{1 \times \sqrt{4}}{\sqrt{4} \times \sqrt{4}} = \frac{1}{2}$

$Df = \mathbb{R} - \left\{ 2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6} \right\}$

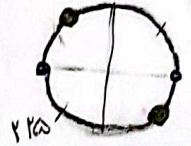


ب) $\frac{\cot x + 1}{\tan x + 1} = \frac{\frac{\cos x}{\sin x} + 1}{\frac{\sin x}{\cos x} + 1}$

$\rightarrow \tan x + 1 \neq 0 \rightarrow \tan x \neq -1$

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

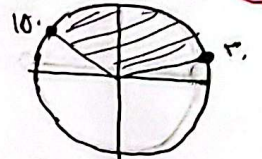
, $\sin x \neq 0$



الف) $y = \sqrt{2\sin x - 1}$

$2\sin x - 1 \geq 0 \rightarrow 2\sin x \geq 1 \rightarrow \sin x \geq \frac{1}{2}$

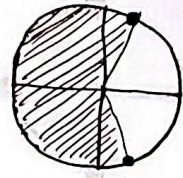
$Df = \left[2k\pi + \frac{\pi}{6}, 2k\pi + \pi - \frac{\pi}{6} \right]$



ب) $y = \sqrt{1 - 2\cos x}$

$1 - 2\cos x \geq 0 \rightarrow 1 \geq 2\cos x \rightarrow \frac{1}{2} \geq \cos x$

$Df = \mathbb{R} - \left\{ 2k\pi + \frac{\pi}{3}, 2k\pi + \frac{5\pi}{3} \right\}$



الف) $y = \sqrt{4-x^2}$ $4-x^2 \geq 0 \rightarrow x^2 \leq 4 \rightarrow x \in [-2, 2]$ $Df = [-2, 2]$ ①
 ب) $y = \sqrt{3-x-2}$ $3-x-2 \geq 0 \rightarrow x \leq 1$ $Df = (-\infty, 1]$

الف) $y = \sqrt{4-2x^2}$ $4-2x^2 \geq 0 \rightarrow x^2 \leq 2 \rightarrow x \in [-\sqrt{2}, \sqrt{2}]$ $Df = [-\sqrt{2}, \sqrt{2}]$ ②
 ب) $y = \sqrt{3|x|-9}$ $3|x|-9 \geq 0 \rightarrow |x| \geq 3 \rightarrow x \in (-\infty, -3] \cup [3, +\infty)$

الف) $y = \sqrt[3]{\frac{|x|+1}{|x|-3}}$ $|x| \neq 3 \rightarrow x \neq \pm 3$ $Df = \mathbb{R} - \{\pm 3\}$ ③
 ب) $y = \sqrt[3]{\frac{\sqrt{x}+1}{\sqrt{x}-3}}$ $\sqrt{x} \neq 3 \rightarrow x \neq 9$ $Df = [0, +\infty) - \{9\}$

الف) $y = \frac{\sqrt{3-|x|}}{|x|+2}$ $3-|x| \geq 0 \rightarrow |x| \leq 3 \rightarrow x \in [-3, 3]$ $Df = [-3, 3]$ ④

ب) $y = \frac{\sqrt{4-x^2}}{|x|-1}$ $4-x^2 \geq 0 \rightarrow x \in [-2, 2]$ $|x| \neq 1 \rightarrow x \neq \pm 1$ $Df = [-2, 2] - \{\pm 1\}$

الف) $y = \frac{x+1}{\sqrt{x+|x|}}$ $x+|x| \geq 0 \rightarrow x \geq 0 \rightarrow Df = \mathbb{R}^+$ ⑤
 ب) $y = \frac{1}{\sqrt{x|x|}}$ $x|x| > 0 \rightarrow x > 0$ $Df = \mathbb{R}^+$

الف) $y = \sqrt{2-[x]}$ $2-[x] \geq 0 \rightarrow [x] \leq 2 \rightarrow Df = (-\infty, 2)$ ⑥
 ب) $y = \frac{1}{\sqrt{2-[x]}}$ $2-[x] > 0 \rightarrow [x] < 2 \rightarrow Df = (-\infty, 2)$

الف) $y = \frac{1}{x[x]}$ $x[x] \neq 0 \rightarrow Df = [0, 0.9)$ ⑦
 ب) $y = \frac{1}{\sqrt{-x[x]}}$ $-x[x] > 0 \rightarrow [x] > x \rightarrow \emptyset$

الف) $y = \sqrt{[x-\frac{1}{x}]+[x+\frac{1}{x}]}$ $[x-\frac{1}{x}]+[x+\frac{1}{x}] \geq 0 \rightarrow Df$ ⑧
 ب) $y = \sqrt{[x-\frac{1}{x}]+[-(x-\frac{1}{x})]}$ $[x-\frac{1}{x}]+[-(x-\frac{1}{x})] \geq 0 \rightarrow Df = [\frac{1}{4}, +\infty)$
 $2[x+\frac{1}{x}] - 1 \geq 0 \Rightarrow [x+\frac{1}{x}] \geq \frac{1}{2} \Rightarrow x+\frac{1}{x} \geq 1$
 $a \in \mathbb{Z} \quad [a]+[-a] = 0$
 $a \notin \mathbb{Z} \quad [a]+[-a] = -1 \Rightarrow x-\frac{1}{x} \in \mathbb{Z}$
 $Df = \{x \mid x = k + \frac{1}{k}, k \in \mathbb{Z}\}$