

ا) $y = \sqrt{4 - \sqrt{2}x}$ $4 - \sqrt{2}x \geq 0$ $x \leq 2$
 $\sqrt{2}x \leq 4 \rightarrow x \leq \frac{4}{\sqrt{2}} = 2\sqrt{2}$ $\rightarrow D_f = [-1.4, 2]$

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

ا) $y = \sqrt{4 - 2x^2}$ $4 - 2x^2 \geq 0$ $2 > x^2$ $x^2 < 2$
 $-\sqrt{2} < x < \sqrt{2}$ $D_f = [-\sqrt{2}, \sqrt{2}]$

ب) $y = \sqrt{3|x|+9}$ $3|x|+9 \geq 0$ $3|x| > -9$
 $|x| > -3$ $\begin{cases} x \geq 3 \\ x \leq -3 \end{cases} \rightarrow D_f = (-\infty, -3] \cup [3, +\infty)$

ا) $y = \sqrt{\frac{|x|+1}{|x|-4}}$ $|x| \neq 4 \rightarrow x \neq \pm 4$ $D_f = \mathbb{R} - \{\pm 4\}$

ب) $y = \sqrt{\frac{\sqrt{x}+1}{\sqrt{x}-4}}$ $x \geq 0$ $\sqrt{x}-4 \neq 0$ $\sqrt{x} \neq 4$
 $\rightarrow x \neq 16 \Rightarrow D_f = [0, +\infty) - \{16\}$

ا) $y = \sqrt{\frac{3-|x|}{|x|+2}}$ $3-|x| \geq 0 \rightarrow |x| \leq 3$
 $-3 \leq x \leq 3$ $D_f = [-3, 3]$

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

الف) $\frac{x+1}{\sqrt{x+1x}} \rightarrow D_f = \mathbb{R}^+$

منفی
مع صفر
صفر و منفی صفری نه
دلی اعداد مثبت و مثبت

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

⊖ - منفی
⊕ - صفری و مثبت

الف) $y = \sqrt{2-[x]} \quad 2-[x] \geq 0 \quad [x] \leq 2$

$D_f = (-\infty, 2)$

ب) $y = \frac{1}{\sqrt{2-[x]}} \quad 2-[x] > 0 \quad [x] < 2$

$D_f = (-\infty, 2)$

الف) $y = \frac{1}{x[x]}$ $x[x] \neq 0$

$[x] \neq 0$
 $x \neq [0, 1)$

$D_f = \mathbb{R} - [0, 1)$

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

$D_f = \emptyset$

ا) $y = \sqrt{\left[x - \frac{1}{r}\right] + \left[x + \frac{r}{r}\right]} \rightarrow \left[x - \frac{1}{r}\right] + \left[x + \frac{r}{r}\right] \geq 0$
 $\xrightarrow{+1} 2\left[x + \frac{r}{r}\right] \geq 1 \rightarrow \left[x + \frac{r}{r}\right] \geq \frac{1}{r} \rightarrow x + \frac{r}{r} \geq \frac{1}{r}$
 $x \geq \frac{1}{r} \quad D_f = \left[\frac{1}{r}, +\infty\right)$

ب) $y = \sqrt{\left[x - \frac{1}{r}\right] + \left[-x + \frac{1}{r}\right]} \rightarrow \left[x - \frac{1}{r}\right] + \left[-\left(x - \frac{1}{r}\right)\right] \geq 0$
 $x - \frac{1}{r} = a \rightarrow [a] + [-a] \geq 0 \quad \begin{cases} a \in \mathbb{Z} & [a] + [-a] = 0 \\ a \notin \mathbb{Z} & [a] + [-a] = -1 \end{cases}$
 $x - \frac{1}{r} \in \mathbb{Z} \rightarrow x \in \mathbb{Z} + \frac{1}{r}$
 $\hookrightarrow D_f = \left\{x \mid x = k + \frac{1}{r}, k \in \mathbb{Z}\right\}$

ا) $y = \frac{1}{r \sin^2 x - 1} \quad r \sin^2 x - 1 \neq 0$
 $r \sin^2 x - 1 \neq 0 \quad \sin^2 x \neq \frac{1}{r} \rightarrow \sin x \neq \pm \frac{\sqrt{r}}{r}$
 $\rightarrow D_f = \mathbb{R} - \left\{\frac{k\pi}{r} + \frac{\pi}{r}\right\}$

ب) $\frac{\cot x + 1}{\tan x + 1} \quad \tan x \neq -1$
 $\tan x \neq -1 \quad D_f = \mathbb{R} - \left\{k\pi, k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4}\right\}$


ا) $y = \sqrt{r \sin x - 1} \quad r \sin x - 1 \geq 0 \quad \sin x \geq \frac{1}{r}$
 $\frac{\pi}{4} \rightarrow D_f = \left[2k\pi + \frac{\pi}{4}, 2k\pi + \frac{3\pi}{4}\right]$


ب) $y = \sqrt{1 - r \cos x} \quad 1 - r \cos x \geq 0 \rightarrow \cos x \leq \frac{1}{r}$
 $\frac{\pi}{4} \rightarrow D_f = \left[2k\pi + \frac{\pi}{r}, 2k\pi + \frac{3\pi}{r}\right]$


