

الف) $\sqrt{2-x} \geq 0 \rightarrow 2-x \geq 0 \rightarrow x \leq 2$

$\sqrt{2-x} \leq 2 \rightarrow 2-x \leq 4 \rightarrow -x \leq 2 \rightarrow x \geq -2$

$D_f = [-2, 2]$

ب) $\sqrt{x-2} \geq 0 \rightarrow x-2 \geq 0 \rightarrow x \geq 2$

$\sqrt{x-2} \leq 2 \rightarrow x-2 \leq 4 \rightarrow x \leq 6$

$D_f = [2, 6]$

ج) $\sqrt{4-x^2} \geq 0 \rightarrow 4-x^2 \geq 0 \rightarrow x^2 \leq 4 \rightarrow -2 \leq x \leq 2$

~~$\sqrt{4-x^2} \leq 2$~~

~~$\sqrt{4-x^2} \leq 2$~~

$D_f = [-2, 2]$

د) $\sqrt{x^2-9} \geq 0 \rightarrow x^2-9 \geq 0 \rightarrow x^2 \geq 9 \rightarrow x \leq -3 \text{ or } x \geq 3$

$D_f = (-\infty, -3] \cup [3, \infty)$

ه) $|x| \neq 2 \rightarrow x \neq \pm 2$

$D_f = \mathbb{R} - \{\pm 2\}$

و) $\sqrt{x} \geq 0 \rightarrow x \geq 0$

$\sqrt{x} \neq 2 \rightarrow x \neq 4$

$\sqrt{x} \neq 2 \rightarrow x \neq 4$

$\sqrt{x} \geq 0 \rightarrow x \geq 0$

$\begin{matrix} \oplus \sqrt{x} \\ \ominus \sqrt{x} \end{matrix}$

$D_f = \{x \geq 0, x \neq 4\}$

ز) $\frac{\sqrt{2-x}}{|x|+2}$

$\sqrt{2-x} \geq 0 \rightarrow 2-x \geq 0 \rightarrow x \leq 2$
 $|x|+2 \neq 0 \rightarrow |x| \neq -2$

$D_f = [-2, 2]$

ح) $\frac{\sqrt{4-x^2}}{|x|-1}$

$\sqrt{4-x^2} \geq 0 \rightarrow 4-x^2 \geq 0 \rightarrow x^2 \leq 4 \rightarrow -2 \leq x \leq 2$
 $|x|-1 \neq 0 \rightarrow |x| \neq 1 \rightarrow x \neq \pm 1$

$D_f = [-2, 2] - \{\pm 1\}$

ط) $x+|x| \geq 0$

$|x| \geq -x$

$D_f = \mathbb{R}^+$

$\begin{matrix} \oplus \sqrt{x} \\ \ominus \sqrt{x} \end{matrix}$

ی) $x|x| \geq 0$

$\begin{matrix} \oplus \sqrt{x} \\ \ominus \sqrt{x} \end{matrix}$

$D_f = \mathbb{R}^+$

الف) $2 - [x] \geq 0 \rightarrow [x] \leq 2 \rightarrow x > 1$ $D_f = (-\infty, 2)$

ب) $2 - [x] > 0 \rightarrow x > 1 \rightarrow x > 1$ $D_f = (-\infty, 2)$

الف) $x[x] \neq 0$
 $0 \leq x < 1$

$D_f = [0, 1)$

ب) $-x[x] > 0$ $D_f = \mathbb{Q}$

الف) $[x - \frac{1}{y}] + [x + \frac{1}{y}] \geq 0 \rightarrow \begin{cases} [x - \frac{1}{y}] + [- (x - \frac{1}{y})] \\ = [x] + [-x] = 0 \rightarrow x \in \mathbb{Z} \\ [x] + [x] = 1 \rightarrow x \notin \mathbb{Z} \end{cases} \rightarrow x - \frac{1}{y} \in \mathbb{Z}$
 $[x + \frac{1}{y} - 1] + [x + \frac{1}{y}] = [x + \frac{1}{y}] - 1 + [x + \frac{1}{y}] \geq 0$
 $[x + \frac{1}{y}] \geq 1 \rightarrow [x + \frac{1}{y}] \geq \frac{1}{y} \rightarrow x + \frac{1}{y} \geq 1 \rightarrow x \geq \frac{1}{y}$ $D_f = \{x | x \neq n + \frac{1}{y}, n \in \mathbb{Z}\}$
 $D_f = [\frac{1}{y}, +\infty)$

الف) $|\sin x| \neq 1 \rightarrow \sin x \neq 1 \rightarrow \sin x \neq \frac{1}{y}$
 $\sin x \neq \sqrt{\frac{1}{y}} \quad \sin x \neq \frac{\sqrt{y}}{y}$ $D_f = \mathbb{R} - \left\{ \left(2k\pi + \frac{\pi}{y}, 2k\pi + \frac{\sqrt{y}}{y} \right) \right\}$

ب) $\tan x \neq -1$ $D_f = \mathbb{R} - \left\{ 2k\pi + \frac{3\pi}{4} \right\}$

الف) $|\sin x| - \sqrt{\frac{1}{y}} \geq 0 \rightarrow \sin x \geq \frac{\sqrt{y}}{y} \Rightarrow D_f = \left[2k\pi + \frac{\pi}{y}, 2k\pi + \frac{\sqrt{y}}{y} \right]$

ب) $1 - \cos x \geq 0 \rightarrow \cos x \leq 1 \rightarrow \cos x \leq \frac{1}{y}$



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