

الف) $y = \sqrt{4-x} \rightarrow 4-x \geq 0 \rightarrow x \leq 4$
 $\& \sqrt{2-x} \geq 0 \rightarrow \sqrt{2-x} \leq 4 \rightarrow 1-x \leq 16 \rightarrow -x \leq 15 \rightarrow x \geq -15$
 $D_f = [-15, 4]$

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

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

ب) $y = \sqrt{3|x|-4} \rightarrow 3|x|-4 \geq 0 \rightarrow 3|x| \geq 4 \rightarrow |x| \geq \frac{4}{3} \rightarrow x \geq \frac{4}{3}$
 $\rightarrow D_f = (-\infty, -\frac{4}{3}] \cup [\frac{4}{3}, +\infty)$

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

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

الف) $\frac{\sqrt{3-|x|}}{\sqrt{|x|+1}} \rightarrow \begin{cases} 3-|x| \geq 0 \rightarrow |x| \leq 3 \rightarrow -3 \leq x \leq 3 \\ |x|+1 \neq 0 \rightarrow |x| \neq -1 \end{cases}$
 $\rightarrow D_f = [-3, 3]$

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

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

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

الف) $y = \sqrt{2-x} \rightarrow 2-x \geq 0 \rightarrow [x] \leq 2 \rightarrow x \leq 3 \rightarrow D_f = (-\infty, 3)$

ب) $y = \frac{1}{\sqrt{2-x}} \rightarrow 2-x > 0 \rightarrow [x] < 2 \rightarrow x < 3 \rightarrow D_f = (-\infty, 3)$

الف) $y = \frac{1}{x[x]}$ $\rightarrow x[x] > 0 \rightarrow$ چون x و $[x]$ همواره هم علامت اند $\rightarrow D_f = \mathbb{R} - \{0\}$
 فقط در صورتی که x صفر نباشد تعریف نشده است.

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

برای x همیشه عدد را
 روی پایین گردی کمتر از
 صحیح همان از خود عدد بزرگتر است
 پس چون پشت x منفی داریم عدد بزرگتر از x است
 پس $-x[x] > 0$ هرگز برقرار نمی شود

الف) $y = \sqrt{[x-\frac{1}{n}] + [x+\frac{1}{n}]} \rightarrow [x-\frac{1}{n}] + [x+\frac{1}{n}] \geq 0 \rightarrow [x+\frac{1}{n}-1] + [x+\frac{1}{n}] \geq 0$
 $\rightarrow [x+\frac{1}{n}] - 1 + [x+\frac{1}{n}] \geq 0 \rightarrow 2[x+\frac{1}{n}] \geq 1 \rightarrow [x+\frac{1}{n}] \geq \frac{1}{2} \rightarrow x+\frac{1}{n} \geq 1$
 $\rightarrow x \geq \frac{1}{n} \rightarrow D_f = [\frac{1}{n}, +\infty)$

ب) $y = \sqrt{[x-\frac{1}{n}] + [-x+\frac{1}{n}]} \rightarrow \sqrt{[x-\frac{1}{n}] + [-x+\frac{1}{n}]} \rightarrow \begin{cases} a \in \mathbb{Z} [a] + [-a] = 0 \\ a \notin \mathbb{Z} [a] + [-a] = -1 \end{cases} \rightarrow x - \frac{1}{n} \in \mathbb{Z}$
 $D_f = \{x \mid x = k + \frac{1}{n}, k \in \mathbb{Z}\}$

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

ب) $y = \frac{\cot x + 1}{\tan x + 1} \rightarrow \begin{cases} \cot x \neq 1 \rightarrow \cot \neq k\pi + \frac{\pi}{4} \\ \tan x \neq 1 \rightarrow \tan \neq k\pi + \frac{\pi}{4} \end{cases} D_f = \mathbb{R} - \{k\pi + \frac{\pi}{4}\}$

الف) $y = \sqrt{5\sin x - 1} \rightarrow 5\sin x - 1 \geq 0 \rightarrow 5\sin x \geq 1 \rightarrow \sin x \geq \frac{1}{5}$
 $2k\pi + \frac{\pi}{6} \leq x \leq 2k\pi + \frac{5\pi}{6} \rightarrow D_f = [2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}]$

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

