

الف) $\sqrt{4-\sqrt{2-x}} \Rightarrow 2-x \geq 0 \Rightarrow \boxed{x \leq 2}$ و $4-\sqrt{2-x} \geq 0 \Rightarrow 4 \geq \sqrt{2-x} \Rightarrow 16 \geq 2-x \Rightarrow \boxed{x \geq -14}$
 $Df = [-14, 2]$

ب) $\sqrt{3-\sqrt{x-2}} \Rightarrow x-2 \geq 0 \Rightarrow \boxed{x \geq 2}$ و $3-\sqrt{x-2} \geq 0 \Rightarrow 3 \geq \sqrt{x-2} \Rightarrow 9 \geq x-2 \Rightarrow \boxed{x \leq 11}$
 $Df = [2, 11]$

الف) $y = \sqrt{4-2x^2} \Rightarrow 4-2x^2 \geq 0 \Rightarrow 4 \geq 2x^2 \Rightarrow 2 \geq x^2 \Rightarrow \sqrt{2} \geq x \geq -\sqrt{2}$
 $Df = [-\sqrt{2}, \sqrt{2}]$

ب) $\sqrt{3|x|-9} \Rightarrow 3|x|-9 \geq 0 \Rightarrow 3|x| \geq 9 \Rightarrow |x| \geq 3 \Rightarrow x \geq 3$ یا $x \leq -3$
 $Df = (-\infty, -3] \cup [3, \infty)$

$y = \sqrt[3]{\frac{|x|+1}{|x|-3}} \Rightarrow |x|-3 \neq 0 \Rightarrow |x| \neq 3 \Rightarrow Df = \mathbb{R} - \{-3, 3\}$
 $x \neq \pm 3$

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

الف) $y = \frac{\sqrt{2-|x|}}{|x|+2} \Rightarrow 2-|x| \geq 0 \Rightarrow 2 \geq |x| \Rightarrow \boxed{-2 \leq x \leq 2}$

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

الف) $x+|x| > 0$
 $\oplus \rightarrow \checkmark$
 $\ominus \rightarrow x$
 $\ominus \rightarrow x$
 $Df = (0, \infty) \text{ or } \mathbb{R}^+$

ب) $x|x| > 0$
 $\oplus \rightarrow \checkmark$
 $\ominus \rightarrow x$
 $\ominus \rightarrow x$
 $\mathbb{R}^+$

$$الف) 2 - [x] > 0 \Rightarrow [x] \leq 2 \Rightarrow Df = (-\infty, 2)$$

٦

$$ب) 2 - |x| > 0 \Rightarrow |x| < 2 \Rightarrow Df = (-\infty, 2)$$

$$الف) x|x| \neq 0 \Rightarrow \begin{matrix} x=0 \\ |x|=0 \Rightarrow x=[0, 1) \end{matrix} \quad R - [0, 1)$$

٧

$$ب) -x|x| > 0 \Rightarrow \emptyset$$

x در حالت آن علامه هم علامت

$$الف) [x - \frac{1}{x}] + [x - \frac{1}{x}] + 1 > 0 \quad 2[x - \frac{1}{x}] > -1 \Rightarrow [x - \frac{1}{x}] > -\frac{1}{2}$$

$$\hookrightarrow Df = [\frac{1}{2}, \infty)$$

٨

$$ب) \sqrt{[x - \frac{1}{x}] + [-x + \frac{1}{x}]} \quad \text{طبق شکل} \quad x - \frac{1}{x} \in \mathbb{Z} \Rightarrow \{x = \frac{1}{x} + k, k \in \mathbb{Z}\}$$

$$الف) 2\sin^2 x - 1 \neq 0 \quad 2\sin^2 x \neq 1 \Rightarrow \sin^2 x \neq \frac{1}{2} \quad \sin x \neq \pm \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$R - \{k\pi \pm \frac{\pi}{4}\}$$


٩

$$ب) \sin x \neq 0 \Rightarrow \text{Unit circle diagram showing points where sin x = 0, which are at 0, π, and 2π. These points are marked with dots on the circle.}$$

$$\cos x \neq 0 \Rightarrow R - \{ \frac{k\pi}{2} \}$$

$$الف) 2\sin x - 1 > 0 \Rightarrow 2\sin x > 1 \Rightarrow \sin x > \frac{1}{2}$$

$$[k\pi - \frac{\pi}{6}, k\pi + \frac{\pi}{6}]$$


١٠

$$ب) 1 - 2\cos x > 0 \Rightarrow 1 > 2\cos x \Rightarrow \frac{1}{2} > \cos x$$

$$R - \{k\pi - \frac{\pi}{3}, k\pi + \frac{\pi}{3}\}$$
