

الف) $y = \sqrt{4 - \sqrt{2-a}}$ $\rightarrow 4 - \sqrt{2-a} \geq 0 \Rightarrow \sqrt{2-a} \leq 4 \Rightarrow 2-a \leq 16 \Rightarrow a \geq -14$
 $\hookrightarrow 4 - \sqrt{2-a} \geq 0 \Rightarrow \sqrt{2-a} \leq 4 \Rightarrow 2-a \leq 16 \Rightarrow a \geq -14$
 $D_f = [-14, 2]$ ✓

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

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

ب) $y = \sqrt{3|a| - 9}$ $\rightarrow 3|a| - 9 \geq 0 \Rightarrow 3|a| \geq 9 \Rightarrow |a| \geq 3 \Rightarrow a \geq 3 \text{ or } a \leq -3$
 $D_f = (-\infty, -3] \cup [3, +\infty)$ ✓

الف) $y = \sqrt{\frac{|a|+1}{|a|-3}}$ $\rightarrow |a|-3 \neq 0 \Rightarrow |a| \neq 3 \Rightarrow a \neq 3, -3$

$D_f = \mathbb{R} - \{3, -3\}$ ✓

ب) $y = \sqrt{\frac{\sqrt{a}+1}{\sqrt{a}-3}}$ $\rightarrow \sqrt{a}-3 \neq 0 \Rightarrow \sqrt{a} \neq 3 \Rightarrow a \neq 9$
 $D_f = \mathbb{R} - \{9\}$ ✓

الف) $y = \frac{\sqrt{3-|a|}}{|a|+2}$ $\rightarrow 3-|a| \geq 0 \Rightarrow 3 \geq |a| \Rightarrow -3 \leq a \leq 3$
 $D_f = [-3, 3]$ ✓

ب) $y = \frac{\sqrt{4-a^2}}{|a|-1}$ $\rightarrow 4-a^2 \geq 0 \Rightarrow 4 \geq a^2 \Rightarrow 2 \geq |a| \Rightarrow -2 \leq a \leq 2$
 $|a|-1 \neq 0 \Rightarrow |a| \neq 1 \Rightarrow a \neq \pm 1$

$D_f = [-2, -1) \cup (-1, 1) \cup (1, 2]$ ✓

الف) $y = \frac{a+1}{\sqrt{a+|a|}}$ $\rightarrow a+|a| > 0$
 $\left. \begin{array}{l} a^+ \rightarrow 2a \checkmark \\ a^- \rightarrow 0 \times \\ a^0 \rightarrow 0 \times \end{array} \right\} \Rightarrow D_f = (0, +\infty)$ ✓

ب) $y = \frac{1}{\sqrt{a|a|}}$ $\rightarrow a|a| > 0$
 $\left. \begin{array}{l} a^+ \rightarrow + \checkmark \\ a^- \rightarrow - \times \\ a^0 \rightarrow 0 \times \end{array} \right\} \Rightarrow D_f = (0, +\infty)$ ✓

الف) $y = \sqrt{x - [a]} \rightarrow x - [a] \geq 0 \Rightarrow x \geq [a] \Rightarrow D_f = (-\infty, +\infty)$ ✓

ب) $y = \frac{1}{\sqrt{x - [a]}} \rightarrow x - [a] > 0 \Rightarrow x > [a] \Rightarrow D_f = (-\infty, +\infty)$ ✓ (2)

الف) $y = \frac{1}{a[x]}$ $\Rightarrow a[x] \neq 0 \Rightarrow D_f = (-\infty, 0) \cup (0, +\infty)$ ✓

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

$\hookrightarrow$ $D_f = \emptyset$ ✓

الف) $y = \sqrt{[a - \frac{1}{x}] + [a + \frac{1}{x}]} \Rightarrow [a - \frac{1}{x}] + [a + \frac{1}{x}] \geq 0 \Rightarrow [a - \frac{1}{x}] + [a + \frac{1}{x} + 1] \geq 1$

ب) $y = \sqrt{[a - \frac{1}{x}] + [-a + \frac{1}{x}]}$

$\Rightarrow [a - \frac{1}{x}] + [-a + \frac{1}{x} + 1] \geq 0 \Rightarrow 1 \geq 0 \Rightarrow D_f = [\frac{1}{x}, +\infty)$ ✓ (2)

$\hookrightarrow a \in \mathbb{Z} \rightarrow [a] - [a] = 0$ ✓
 $a \notin \mathbb{Z} \rightarrow [a] - [a] = -1$ ✓

$\Rightarrow a - \frac{1}{x} \in \mathbb{Z} \Rightarrow D_f = \{x \mid x = k + \frac{1}{x}, k \in \mathbb{Z}\}$ ✓

الف) $y = \frac{1}{x \sin^2 x - 1} \Rightarrow x \sin^2 x - 1 \neq 0 \Rightarrow x \sin^2 x \neq 1 \Rightarrow \sin^2 x \neq \frac{1}{x}$
 $\Rightarrow D_f = \mathbb{R} - \{k\frac{\pi}{x} + \frac{\pi}{x}\}$ ✓ (2)



ب) $y = \frac{\cot x + 1}{\tan x + 1} \Rightarrow \sin x \neq 0$
 $\tan x + 1 \rightarrow \cos x \neq 0$
 $\hookrightarrow \tan x + 1 \neq 0 \Rightarrow \tan x \neq -1$
 $\Rightarrow D_f = \mathbb{R} - \{k\frac{\pi}{x}, k\pi + \frac{\pi}{x}\}$ ✓ (2)



الف) $y = \sqrt{x \sin x - 1} \Rightarrow x \sin x \geq 1 \Rightarrow \sin x \geq \frac{1}{x}$

$D_f = [2K\pi + \frac{\pi}{4}, 2K\pi + \frac{5\pi}{4}]$ ✓



ب) $y = \sqrt{1 - x \cos x} \Rightarrow 1 - x \cos x \geq 0 \Rightarrow 1 \geq x \cos x \Rightarrow \cos x \geq \frac{1}{x}$

$\Rightarrow D_f = [2K\pi + \frac{\pi}{x}, 2K\pi - \frac{\pi}{x}]$ ✓



$2K\pi + \frac{0\pi}{x}$