

الف)  $y = \sqrt{4 - \sqrt{4 - a}}$   $\rightarrow 4 - \sqrt{4 - a} \geq 0 \Rightarrow \sqrt{4 - a} \leq 4 \Rightarrow 4 - a \leq 16 \Rightarrow a \geq -12$   
 $\hookrightarrow 4 - \sqrt{4 - a} \geq 0 \Rightarrow \sqrt{4 - a} \leq 4 \Rightarrow 4 - a \leq 16 \Rightarrow a \geq -12$

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

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

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

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)  $y = \sqrt{\frac{\sqrt{a} + 1}{\sqrt{a} - 3}}$   $\rightarrow \sqrt{a} - 3 \neq 0 \Rightarrow \sqrt{a} \neq 3 \Rightarrow a \neq 9$

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

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)  $y = \sqrt{2-x} \rightarrow 2-x \geq 0 \Rightarrow x \leq 2 \Rightarrow D_f = (-\infty, 2)$

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

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

ب)  $y = \frac{1}{\sqrt{-a[x]}} \Rightarrow -a[x] > 0$   
 $\hookrightarrow$  معني يا صفر  $\Rightarrow D_f = \emptyset$

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)  $y = \sqrt{\underbrace{[a-\frac{1}{x}]}_a + \underbrace{[-a+\frac{1}{x}]}_{-a}}$   $\Rightarrow [a-\frac{1}{x}] + [-a+\frac{1}{x}] \geq 0 \Rightarrow 2[a-\frac{1}{x}] \geq -1$   
 $\Rightarrow [a-\frac{1}{x}] \geq -\frac{1}{2} \Rightarrow D_f = [\frac{1}{x}, +\infty)$

$\left. \begin{array}{l} a \in \mathbb{Z} \rightarrow [a] - [a] = 0 \\ a \notin \mathbb{Z} \rightarrow [a] - [a] = -1 \end{array} \right\} \Rightarrow a - \frac{1}{x} \in \mathbb{Z} \Rightarrow D_f = \{a \mid a = k + \frac{1}{x}, k \in \mathbb{Z}\}$

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



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



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



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

