

الف) $y = \frac{\sqrt{x^2 - 2x}}{x^2 - x}$ $\rightarrow \frac{x(x-1)}{x(x-(x+1))} \geq 0 / x(x-1)(x+1) \neq 0$ $\rightarrow \frac{-1}{-1} + \frac{0}{0} + \frac{1}{1} \rightarrow D_f = (-1, 0) \cup (0, 1) \cup (1, \infty)$	ب) $y = \sqrt{\frac{x^2 - 2x}{x^2 - x}}$ $\rightarrow \frac{x^2(x-1)(x+1)}{x^2(x-1)(x+1)} \geq 0 / x(x-1)(x+1) \neq 0$ $\rightarrow \frac{-1}{-1} + \frac{0}{0} + \frac{1}{1} \rightarrow D_f = \mathbb{R} - \{-1, 0, 1\}$	۱
الف) $y = \frac{x+1}{\sqrt{x+ x }}$ $\rightarrow x+ x > 0 \rightarrow x > 0$ $\rightarrow D_f = (0, +\infty)$	ب) $y = \frac{1}{\sqrt{x+ x }}$ $x < 0 / x+ x < 0$ $x > 0 / x+ x > 0$ $\rightarrow x+ x > 0 \rightarrow x > 0$ $\rightarrow D_f = (0, +\infty)$	۲
الف) $y = \sqrt{2-[x]}$ $\rightarrow 2-[x] \geq 0 \rightarrow [x] \leq 2 \rightarrow x < 3$ $\rightarrow D_f = (-\infty, 3)$	ب) $y = \frac{1}{\sqrt{2-[x]}}$ $\rightarrow 2-[x] > 0 \rightarrow [x] < 2 \rightarrow x < 2$ $\rightarrow D_f = (-\infty, 2)$	۳
الف) $y = \sqrt{[x - \frac{1}{2}] + [x + \frac{1}{2}]}$ $\downarrow$ $[x - 1 + \frac{1}{2}]$ $\rightarrow 2[x + \frac{1}{2}] - 1 \geq 0 \rightarrow [x + \frac{1}{2}] \geq \frac{1}{2}$ $\rightarrow x + \frac{1}{2} \geq 1 \rightarrow x \geq \frac{1}{2} \rightarrow D_f = [\frac{1}{2}, +\infty)$	ب) $y = \sqrt{[x - \frac{1}{2}] + [x + \frac{1}{2}]}$ $\downarrow$ $[-(x-1)]$ $\rightarrow a \in \mathbb{Z} \cdot [a] + [-a] = 0$ $\rightarrow x - \frac{1}{2} \in \mathbb{Z} \rightarrow D_f = \{k + \frac{1}{2} / k \in \mathbb{Z}\}$	۴
الف) $y = \frac{1}{\sin x - 1}$ $\rightarrow \sin x \neq 1$ $\rightarrow D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$	ب) $y = \frac{1}{1 - \sin x}$ $\rightarrow 1 - \sin x \neq 0 \rightarrow \sin x \neq 1$ $\rightarrow D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$	۵

الف) $y = \sqrt{2 \sin x - 1}$ $\rightarrow 2 \sin x - 1 \geq 0 \Rightarrow \sin x \geq \frac{1}{2}$ $\rightarrow D_f = \left[2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6} \right]$	ب) $y = \sqrt{\cos x - 1}$ $\rightarrow \cos x - 1 \geq 0 \Rightarrow \cos x \geq 1$ $\rightarrow D_f = [2k\pi]$	6
الف) $y = x ^{-2}$ $\rightarrow -1 \leq x ^{-2} \leq 1 \rightarrow 2 \leq x \leq \infty \Rightarrow \begin{cases} -x \leq -2 \\ x \leq -2 \\ x \geq 2 \end{cases}$ $\rightarrow D_f = [-\infty, -2] \cup [2, \infty]$	ب) $y = \arcsin(x^2 + 2x + 1)$ $\rightarrow -1 \leq x^2 + 2x + 1 \leq 1 \Rightarrow \begin{cases} (x+1)(x+3) \geq 0 \\ x(x+2) \leq 0 \end{cases}$ $\rightarrow D_f = [-3, -1] \cup [-2, 0]$	7
الف) $y = \sqrt{2 - \log_2(x)}$ $\rightarrow x - 2 \geq 0 \rightarrow x \geq 2 / 2 - \log_2(x) \geq 0$ $\rightarrow \log_2(x-2) \leq 2 \rightarrow x \leq 11$ $\rightarrow D_f = (2, 11]$	ب) $y = \log(n^2 - n)$ $\rightarrow n(n+1)(n-1) \geq 0$ $\rightarrow D_f = (-1, 0) \cup (1, +\infty)$	8
الف) $y = \frac{x}{x^2 + 1} \rightarrow x \neq -1 \rightarrow x \neq \log_2^{-1}$ $\rightarrow D_f = \mathbb{R}$	ب) $y = \frac{x}{x^2 - 1} \rightarrow x \neq 1 \rightarrow x \neq 0$ $\rightarrow D_f = \mathbb{R} - \{0\}$	9
ج) $y = \frac{x}{x^2 - 2} \rightarrow x \neq \sqrt{2} \rightarrow x \neq \log_2^{\sqrt{2}}$ $\rightarrow D_f = \mathbb{R} - \{\log_2^{\sqrt{2}}\}$	د) $y = \frac{x}{x^2 - 2} \rightarrow x \neq \sqrt{2} \rightarrow x \neq \log_2^{\sqrt{2}}$ $\rightarrow D_f = \mathbb{R} - \{\log_2^{\sqrt{2}}\}$	
الف) $y = (x+1)!$ $\rightarrow x+1 \in \mathbb{N} \rightarrow x \leq \frac{100-1}{1}$ $\rightarrow D_f = \left\{ \frac{k-1}{k} / k \in \mathbb{N} \right\}$	ب) $y = \left(\frac{mx-2}{2x-5} \right)!$ $\frac{ax+b}{cx+d} = y \rightarrow x = \frac{cy-b}{cy-a}$ $\rightarrow \frac{2m-2}{2x-5} \in \mathbb{N}$ $\rightarrow D_f = \left\{ \frac{2k-2}{2k-5} / k \in \mathbb{N} \right\}$	10