

الف) $y = \frac{\sqrt{x^2 - 2x}}{x^2 - x}$ $\rightarrow \frac{x(x-2)}{x(x-1)(x+1)} \geq 0 / x(x-1)(x+1) \neq 0$ $\rightarrow \frac{-1}{x} + \frac{2}{x-1} + \frac{1}{x+1} \rightarrow D_f = (-1, 0) \cup (0, 1) \cup (1, \infty)$ ✓ (ب)	ب) $y = \frac{\sqrt{x^2 - 2x}}{x^2 - x}$ $\rightarrow \frac{x(x-2)}{x(x-1)(x+1)} \geq 0 / x(x-1)(x+1) \neq 0$ $\rightarrow \frac{-1}{x} + \frac{2}{x-1} + \frac{1}{x+1} \rightarrow D_f = \mathbb{R} - \{-1, 0, 1\}$ 19, 17, 18	1
الف) $y = \frac{x+1}{\sqrt{x+ x }}$ $\rightarrow x+ x > 0 \rightarrow x > 0$ $\rightarrow D_f = (0, +\infty)$ ✓ (ب)	ب) $y = \frac{1}{\sqrt{x+ x }}$ $x < 0 / x+ x < 0$ $x > 0 / x+ x > 0$ $\rightarrow x+ x > 0 \rightarrow x > 0$ $\rightarrow D_f = (0, +\infty)$ 2	2
الف) $y = \sqrt{2-x}$ $\rightarrow 2-x \geq 0 \rightarrow [x] \leq 2 \rightarrow x \leq 2$ $\rightarrow D_f = (-\infty, 2)$ ✓ (ب)	ب) $y = \frac{1}{\sqrt{2-x}}$ $\rightarrow 2-x > 0 \rightarrow [x] < 2 \rightarrow x < 2$ $\rightarrow D_f = (-\infty, 2)$ 3	3
الف) $y = \sqrt{[x - \frac{1}{2}] + [x + \frac{1}{2}]}$ $[x - 1 + \frac{1}{2}]$ $\rightarrow 2[x + \frac{1}{2}] - 1 \geq 0 \rightarrow [x + \frac{1}{2}] \geq \frac{1}{2}$ $\rightarrow x + \frac{1}{2} \geq 1 \rightarrow x \geq \frac{1}{2} \rightarrow D_f = [\frac{1}{2}, +\infty)$ ✓ (ب)	ب) $y = \sqrt{[x - \frac{1}{2}] + [x + \frac{1}{2}]}$ $[-(x-1)]$ $\rightarrow a \in \mathbb{Z} \cdot [a] + [-a] = 0$ $\rightarrow x - \frac{1}{2} \in \mathbb{Z} \rightarrow D_f = \{k + \frac{1}{2} / k \in \mathbb{Z}\}$ 4	4
الف) $y = \frac{1}{\sin x - 1}$ $\rightarrow \sin x \neq 1$ $\rightarrow D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$ ✓ (ب)	ب) $y = \frac{1}{1 - \sin x}$ $\rightarrow 1 - \sin x \neq 0 \rightarrow \sin x \neq 1$ $\rightarrow D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$ 5	5

الف) $y = \sqrt{2 \sin x - 1}$ $\rightarrow 2 \sin x - 1 \geq 0 \Rightarrow \sin x \geq \frac{1}{2}$ $\rightarrow D_f = [2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}]$ (✓) ✓	ب) $y = \sqrt{\cos x - 1}$ $\rightarrow \cos x - 1 \geq 0 \Rightarrow \cos x \geq 1$ $\rightarrow D_f = [2k\pi]$	6
الف) $y = x ^{-2}$ $\rightarrow -1 \leq x ^{-2} \leq 1 \rightarrow 2 \leq x \leq \infty \Rightarrow \begin{cases} -\infty < x \leq -2 \\ 2 \leq x < \infty \end{cases}$ $\rightarrow D_f = [-\infty, -2] \cup [2, \infty]$ (✓) ✓	ب) $y = \arcsin(x^2 + 2x + 1)$ $\rightarrow -1 \leq x^2 + 2x + 1 \leq 1 \Rightarrow \begin{cases} (x+1)(x+3) \geq 0 \\ x(x+2) \leq 0 \end{cases}$ $\rightarrow D_f = [-3, -1] \cup [-1, 0]$	7
الف) $y = \sqrt{2 - \log_2(x)}$ $\rightarrow x - 2 \geq 0 \rightarrow x \geq 2 / 2 - \log_2(x) \geq 0$ $\rightarrow \log_2(x-2) \leq 2 \rightarrow x \leq 10$ $\rightarrow D_f = (2, 10]$ (✓) ✓	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) $y = (x+1)!$ $\rightarrow x+1 \in \mathbb{N} \rightarrow x \leq \frac{100-1}{1}$ $\rightarrow D_f = \{\frac{k-1}{k} / k \in \mathbb{N}\}$ (✓) ✓	ب) $y = (\frac{mx-2}{2x-a})!$ $\frac{ax+b}{cx+d} = y \rightarrow nx = \frac{dy-b}{cy-a}$ $\rightarrow \frac{2mx-2}{2x-a} \in \mathbb{N}$ $\rightarrow D_f = \{\frac{ak-2}{2k-a} / k \in \mathbb{N}\}$	10