

x	$-\infty$	-1	0^*	1	5	$+\infty$
$f(x)$	$-$	0	$+$	5	$-$	0

x	$-\infty$	-1	0	1	$+\infty$
$f(x)$		$+$	$-$	$+$	

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الف) $y = \sqrt{2 \sin x - 1} \Rightarrow 2 \sin x \geq 1 \Rightarrow \sin x \geq \frac{1}{2} \Rightarrow x = [2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}]$ $D_f = [2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}]$ ب) $\sqrt{\cos x - 1} \Rightarrow \cos x \geq 1 \Rightarrow x = \{2k\pi\}$ $D_f = \{2k\pi\}$	6
الف) $\cos y = x - 2 \Rightarrow -1 \leq x - 2 \leq 1 \Rightarrow 1 \leq x \leq 3 \Rightarrow \begin{cases} 1 \leq x \leq 3 \\ -3 \leq x \leq -1 \end{cases}$ $D_f = [-3, -1] \cup [1, 3]$ ب) $y = \arcsin(x^2 + 2x + 1) \Rightarrow -1 \leq x^2 + 2x + 1 \leq 1 \Rightarrow \begin{cases} x^2 + 2x + 1 \leq 1 \Rightarrow x^2 + 2x \leq 0 \Rightarrow x(x+2) \leq 0 \\ x^2 + 2x + 1 \geq -1 \Rightarrow x^2 + 2x + 2 \geq 0 \Rightarrow (x+1)^2 + 1 \geq 0 \end{cases}$ $D_f = [-2, -1] \cup [1, 2]$	7
الف) $y = \sqrt{2 - \log_{\frac{1}{2}}(x-1)} \xrightarrow{x > 1} 2 - \log_{\frac{1}{2}}(x-1) \geq 0 \Rightarrow \log_{\frac{1}{2}}(x-1) \leq 2 \Rightarrow x-1 \leq 4 \Rightarrow x \leq 5$ $D_f = (1, 5]$ ب) $y = \log_{\frac{1}{2}}(x^2 - x) \xrightarrow{x^2 - x > 0} x^2 - x > 0$ $D_f = (-1, 0) \cup (1, +\infty)$	8
الف) $y = \frac{x}{\varepsilon x + 1}$ $D_f = \mathbb{R}$ ج) $y = \frac{x}{\varepsilon x - 1}$ $D_f = \mathbb{R} - \{\log_{\varepsilon} 1\}$	9
الف) $y = (\varepsilon x + 1)! \quad (k \in \mathbb{W})$ $\varepsilon x + 1 = k \Rightarrow \varepsilon x = k - 1 \Rightarrow x = \frac{k-1}{\varepsilon}$ $D_f = \{x x = \frac{k-1}{\varepsilon}, k \in \mathbb{W}\}$ ب) $y = \left(\frac{\varepsilon x - 1}{\varepsilon x + 2}\right)! \quad (k \in \mathbb{W})$ $\frac{\varepsilon x - 1}{\varepsilon x + 2} = k \Rightarrow \varepsilon x - 1 = k(\varepsilon x + 2) \Rightarrow \varepsilon x - 1 = \varepsilon k x + 2k \Rightarrow (\varepsilon - \varepsilon k)x = 2k + 1 \Rightarrow x = \frac{2k+1}{\varepsilon(1-k)}$ $D_f = \{x x = \frac{2k+1}{\varepsilon(1-k)}, k \in \mathbb{W}\}$	10