

الف) $f(x)+2$	ب) $2f(x)$	ج) $f(x-1)$	د) $-f(x)$	
				1
الف) $x^2-5x+6 > 0 \rightarrow (x-2)(x-3) > 0 \rightarrow \frac{2}{+} \frac{3}{-} \frac{+}{+} \quad (-\infty, 2) \cup (3, +\infty)$ ب) $x^2-6x+9 < 0 \rightarrow (x-3)(x-3) < 0 \rightarrow \frac{3}{+} \frac{3}{-} \frac{0}{+} \quad (1, 3)$ ج) $x^2+4x+4 \geq 0 \rightarrow (x+2)(x+2) \geq 0 \rightarrow \frac{-2}{+} \frac{-2}{-} \frac{+}{+} \quad (-\infty, -2] \cup [-2, +\infty)$ د) $x^2-7x+12 \leq 0 \rightarrow (x-3)(x-4) \leq 0 \rightarrow \frac{3}{+} \frac{4}{-} \frac{+}{+} \quad [3, 4]$	2			
الف) $\frac{x^2-3x+2}{x-5} < 0 \rightarrow \frac{(x-1)(x-2)}{x-5} < 0 \rightarrow \frac{1}{-} \frac{2}{+} \frac{5}{-} \frac{0}{+} \quad (-\infty, 1) \cup (2, 5)$ ب) $\frac{x^2-1}{x^2-4x+4} \geq 0 \rightarrow \frac{x^2-1}{(x-2)(x-2)} \geq 0 \rightarrow \frac{-1}{+} \frac{1}{-} \frac{2}{-} \frac{2}{+} \frac{0}{+} \quad (-\infty, -1] \cup (2, +\infty)$	3			
الف) $y = \sqrt{\frac{x^2-1}{x^2-x}} \rightarrow \frac{x^2-1}{x^2-x} \geq 0 \rightarrow \frac{x^2-1}{x(x-1)} \geq 0 \rightarrow \frac{-1}{+} \frac{1}{-} \frac{0}{+} \frac{1}{+} \frac{+}{+} \quad (-\infty, -1) \cup (0, 1) \cup (1, +\infty)$ ب) $y = \sqrt{\frac{x^2-16}{x^2-5x+4}} \rightarrow \frac{x^2-16}{x^2-5x+4} \geq 0 \rightarrow \frac{(x-4)(x+4)}{(x-4)(x-1)} \geq 0 \rightarrow \frac{-4}{+} \frac{1}{-} \frac{1}{+} \frac{4}{+} \frac{+}{+} \quad (-\infty, -4] \cup (1, 4) \cup (4, +\infty)$	4			
الف) $y = \sqrt{4-\sqrt{4-x}} \rightarrow \begin{cases} 4-\sqrt{4-x} \geq 0 \rightarrow 4 \geq \sqrt{4-x} \rightarrow -1 \leq x < 4 \\ 4-x \geq 0 \rightarrow 4 \geq x \end{cases} \quad x = [-1, 4]$ ب) $y = \sqrt{3-\sqrt{x-2}} \rightarrow \begin{cases} x-2 \geq 0 \rightarrow x \geq 2 \\ 3-\sqrt{x-2} \geq 0 \rightarrow 3 \geq \sqrt{x-2} \rightarrow x \leq 11 \end{cases} \quad x = [2, 11]$	5			

$$\text{الف) } y = \sqrt{4-2x^2} \rightarrow 4-2x^2 \geq 0 \rightarrow 2(2-x^2) \geq 0 \rightarrow \frac{-\sqrt{2}}{-2} \leq x \leq \frac{\sqrt{2}}{-2} \quad [-\sqrt{2}, \sqrt{2}]$$

$$\text{ب) } y = \sqrt{3|x|-9} \rightarrow 3|x|-9 \geq 0 \rightarrow 3(|x|-3) \geq 0 \rightarrow \frac{-3}{+3} \leq x \leq \frac{3}{-3} \quad (-\infty, -3] \cup [3, +\infty)$$

$$\text{الف) } y = \sqrt[3]{\frac{|x|+1}{|x|-3}} \rightarrow |x|-3 \neq 0 \rightarrow |x| \neq 3 \rightarrow \mathbb{R} - \{-3, 3\}$$

$$\text{ب) } y = \sqrt[3]{\frac{\sqrt{x}+1}{\sqrt{x}-3}} \rightarrow \sqrt{x}-3 \neq 0 \rightarrow \sqrt{x} \neq 3 \quad x \geq 0 \quad \left. \vphantom{\sqrt{x} \neq 3} \right\} D_f = [0, +\infty) - \{9\}$$

$$\text{الف) } y = \frac{\sin x}{2\cos x - 1} \rightarrow 2\cos x - 1 \neq 0 \rightarrow 2\cos x \neq 1 \rightarrow \cos x \neq \frac{1}{2} \rightarrow D_f = \mathbb{R} - \left\{2k\pi \pm \frac{\pi}{3}\right\}$$

$$\text{ب) } y = \frac{\cos x + 1}{2\sin x + 1} \rightarrow 2\sin x + 1 \neq 0 \rightarrow 2\sin x \neq -1 \rightarrow \sin x \neq -\frac{1}{2} \rightarrow D_f = \mathbb{R} - \left\{2k\pi - \frac{\pi}{6}, 2k\pi - \frac{5\pi}{6}\right\}$$

$$\text{ج) } y = \frac{\tan x + 2}{\cot x - 1} \rightarrow \begin{cases} \frac{\sin}{\cos} \rightarrow \cos \neq 0 \\ \frac{\cos}{\sin} \rightarrow \sin \neq 0 \end{cases}, \frac{\cos}{\sin} - 1 \neq 0 \rightarrow \frac{\cos}{\sin} \neq 1 \rightarrow D_f = \mathbb{R} - \left\{\frac{k\pi}{2}, 2k\pi + \frac{\pi}{4}, 2k\pi + \frac{5\pi}{4}\right\}$$

$$\text{د) } y = \frac{\sin^2 x + 1}{2\sin^2 x - 3} \rightarrow 2\sin^2 x - 3 \neq 0 \rightarrow 2\sin^2 x \neq 3 \rightarrow \sin^2 x \neq \frac{3}{2} \rightarrow D_f = \mathbb{R} - \left\{2k\pi + \frac{\pi}{2}, 2k\pi + \frac{3\pi}{2}, 2k\pi + \frac{5\pi}{2}, 2k\pi + \frac{7\pi}{2}\right\}$$

$$y = \frac{1}{\sqrt{2|x-2| - \frac{1}{2}}} \rightarrow 2|x-2| - \frac{1}{2} > 0 \rightarrow 2|x-2| > \frac{1}{2} \rightarrow |x-2| > \frac{1}{4} \quad \left(-\infty, \frac{7}{4} \right) \cup \left(\frac{9}{4}, +\infty \right) \quad \frac{\frac{1}{2}}{+2} \quad \frac{\frac{1}{2}}{-2}$$

$$\text{الف) } y = \sqrt{4-2|x|} \rightarrow 4-2|x| \geq 0 \rightarrow 2(2-|x|) \geq 0 \rightarrow \frac{-2}{-2} \leq x \leq \frac{2}{-2} \quad [-2, 2]$$

$$\text{ب) } y = \sqrt{\frac{|x|}{|x|}} \quad \mathbb{R} - \{0\} \quad \sqrt{\frac{11}{11}} = 1 \leq \sqrt{\frac{1-1}{1-1}} = \sqrt{\frac{1}{1}} = 1$$