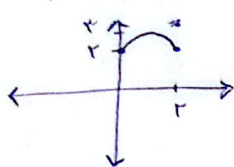
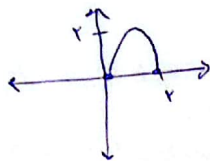


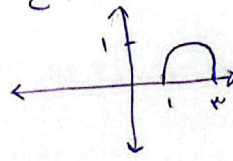
الف) $f(x) + 2$



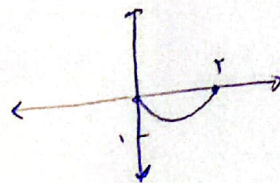
ب) $2 \neq f(x)$



ج) $f(x-1)$



د) $-f(x)$



الف) $x^2 - 5x + 4 > 0$
 $(x-4)(x-1) > 0$
 ④ ⑤

$\frac{2}{+} \frac{4}{-} \frac{4}{+}$
 $(-\infty, 1) \cup (4, +\infty)$

ج) $x^2 + 4x + 5 > 0$
 $(x+1)(x+5) > 0$
 ① ⑤

$\frac{-5}{+} \frac{-1}{-} \frac{1}{+}$
 $(-\infty, -5] \cup [-1, +\infty)$

ب) $x^2 - 4x + 5 < 0$
 $(x-1)(x-5) < 0$
 ① ⑤

$\frac{1}{+} \frac{5}{-} \frac{5}{+}$
 $(1, 5)$

د) $x^2 - 7x + 4 \leq 0$
 $(x-1)(x-4) \leq 0$
 ① ④

$\frac{1}{+} \frac{4}{-} \frac{4}{+}$
 $[1, 4]$

الف) $\frac{x^2 - 3x + 2}{x-5} < 0 \Rightarrow \frac{(x-2)(x-1)}{(x-5)}$
 ⑤ ① ⑤

$\frac{1}{-} \frac{2}{+} \frac{5}{-}$
 $(-\infty, 1) \cup (2, 5)$

ب) $\frac{x^2 - 1}{x^2 - 4x + 5} \geq 0 \Rightarrow \frac{(x+1)(x-1)}{(x-5)(x-1)}$
 ① ⑤ ①

$\frac{-1}{+} \frac{1}{-} \frac{5}{-}$
 $(-\infty, -1) \cup (5, +\infty)$

الف) $y \leq \sqrt{\frac{x^2 - 1}{x^2 - x}} \Rightarrow \frac{x^2 - 1}{x^2 - x} \geq 0 \Rightarrow \frac{x^2 - 1}{x(x+1)(x-1)}$
 ① ⑤ ① ⑤
 $D_f = (-\infty, -1) \cup (0, 1) \cup (1, +\infty)$

$\frac{-1}{+} \frac{0}{-} \frac{1}{+}$
 $\frac{1}{+} \frac{0}{-} \frac{1}{+}$

ب) $y \leq \sqrt{\frac{x^2 - 14}{x^2 - 5x + 4}} \Rightarrow \frac{x^2 - 14}{x^2 - 5x + 4} \geq 0 \Rightarrow \frac{(x+4)(x-4)}{(x-4)(x-1)}$
 ⑤ ① ⑤ ①
 $D_f = (-\infty, -4] \cup (1, 4) \cup (4, +\infty)$

$\frac{-4}{+} \frac{1}{-} \frac{4}{+}$
 $\frac{-1}{+} \frac{1}{-} \frac{1}{+}$

الف) $y \leq \sqrt{4 - \sqrt{2-x}}$
 $\begin{cases} 2-x \geq 0 \Rightarrow x \leq 2 \\ 4 - \sqrt{2-x} \geq 0 \Rightarrow 4 \geq \sqrt{2-x} \Rightarrow 16 \geq 2-x \Rightarrow x \geq -14 \end{cases}$
 $D_f = [-14, 2]$

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ب) $y \leq \sqrt{3 - \sqrt{x-2}}$
 $\begin{cases} x-2 \geq 0 \Rightarrow x \geq 2 \\ 3 - \sqrt{x-2} \geq 0 \Rightarrow 3 \geq \sqrt{x-2} \Rightarrow 9 \geq x-2 \Rightarrow x \leq 11 \end{cases}$
 $D_f = [2, 11]$

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$$\text{اذا } y = \sqrt{\varepsilon - x^2} \Rightarrow \varepsilon - x^2 \geq 0 \Rightarrow \varepsilon \geq x^2 \Rightarrow x^2 \leq \varepsilon \Rightarrow -\sqrt{\varepsilon} \leq x \leq \sqrt{\varepsilon}$$

$$D_f = [-\sqrt{\varepsilon}, \sqrt{\varepsilon}]$$

$$\text{اذا } y = \sqrt{x|x| - 9} \Rightarrow x|x| - 9 \geq 0 \Rightarrow x|x| \geq 9 \Rightarrow |x| \geq 3$$

$$D_f = (-\infty, -3] \cup [3, +\infty)$$

$$\text{اذا } y = \sqrt{\frac{|x|+1}{|x|-4}} \Rightarrow |x|-4 \neq 0 \Rightarrow |x| \neq 4 \quad D_f = \mathbb{R} - \{\pm 4\}$$

$$\text{اذا } y = \sqrt{\frac{\sqrt{x}+1}{\sqrt{x}-4}} \Rightarrow \sqrt{x}-4 \neq 0 \Rightarrow \sqrt{x} \neq 4 \Rightarrow x \neq 16$$

$$D_f = \mathbb{R} - \{16\}$$

$$\text{اذا } y = \frac{\sin x}{\cos x - 1} \Rightarrow \cos x - 1 \neq 0 \Rightarrow \cos x \neq 1 \Rightarrow x \neq 2k\pi$$

$$D_f = \mathbb{R} - \{2k\pi + \frac{0}{2}, 2k\pi + \frac{2\pi}{2}\}$$

$$\text{اذا } y = \frac{\cos x + 1}{\sin x + 1} \Rightarrow \sin x + 1 \neq 0 \Rightarrow \sin x \neq -1 \Rightarrow x \neq \frac{3\pi}{2} + 2k\pi$$

$$D_f = \mathbb{R} - \{2k\pi + \frac{3\pi}{2}, 2k\pi + \frac{5\pi}{2}\}$$

$$\text{اذا } y = \frac{\tan x + 2}{\cot x - 1} \Rightarrow \cot x - 1 \neq 0 \Rightarrow \cot x \neq 1 \Rightarrow \frac{\cos x}{\sin x} \neq 1$$

$$D_f = \mathbb{R} - \{k\pi, 2k\pi \pm \frac{\pi}{4}\}$$

$$\text{اذا } y = \frac{\sin x + 1}{\varepsilon \sin x - \varepsilon} \Rightarrow \varepsilon \sin x - \varepsilon \neq 0 \Rightarrow \varepsilon \sin x \neq \varepsilon \Rightarrow \sin x \neq 1 \Rightarrow x \neq \frac{\pi}{2} + 2k\pi$$

$$D_f = \mathbb{R} - \{k\pi \pm \frac{\pi}{2}\}$$

$$y = \frac{1}{\sqrt{|x-2| - \frac{1}{x}}} \Rightarrow |x-2| - \frac{1}{x} > 0 \Rightarrow |x-2| > \frac{1}{x}$$

$$\begin{cases} x-2 > \frac{1}{x} \Rightarrow x > 2 + \frac{1}{x} \\ x-2 < -\frac{1}{x} \Rightarrow x < 2 - \frac{1}{x} \end{cases} \quad D_f = (-\infty, 1 + \frac{1}{2}) \cup (2 + \frac{1}{2}, +\infty)$$

$$\text{اذا } y = \sqrt{\varepsilon - 2|x|} \Rightarrow \varepsilon - 2|x| \geq 0 \Rightarrow \varepsilon \geq 2|x| \Rightarrow |x| \leq \frac{\varepsilon}{2}$$

$$D_f = [-\frac{\varepsilon}{2}, \frac{\varepsilon}{2}]$$

$$\text{اذا } y = \sqrt{\frac{|x|}{|x|}} \quad D_f = \mathbb{R} - \{0\}$$

