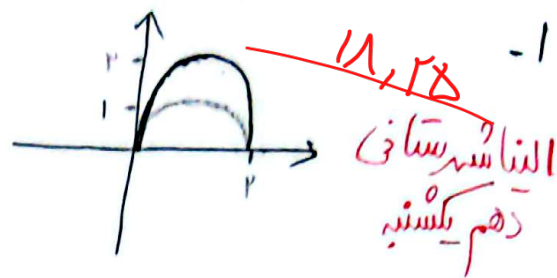


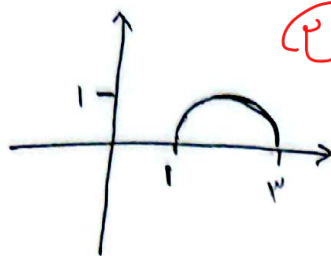
الف) $f(x) + 2$



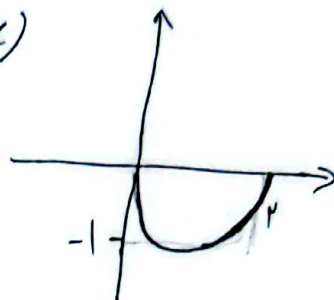
ب) $2f(x)$



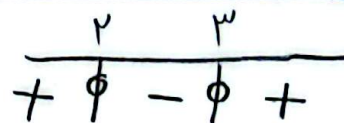
ج) $f(x-1)$



د) $-f(x)$

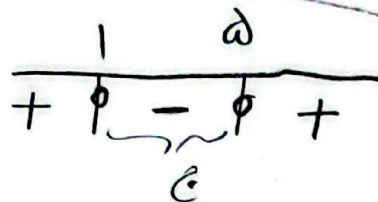


الف) $x^2 - 5x + 6 > 0 \rightarrow (x-2)(x-3) > 0$



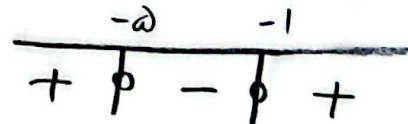
$D_f = (-\infty, 2) \cup (3, +\infty)$

ب) $x^2 - 6x + 5 < 0 \rightarrow (x-1)(x-5) < 0$



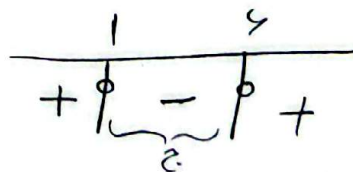
$D_f = (1, 5)$

ج) $x^2 + 6x + 5 \geq 0 \rightarrow (x+1)(x+5) \geq 0$



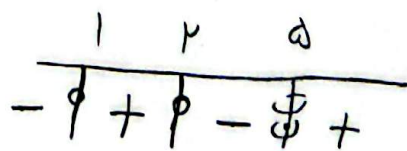
$D_f = (-\infty, -5] \cup [-1, +\infty)$

د) $x^2 - 7x + 6 \leq 0 \rightarrow (x-1)(x-6) \leq 0$



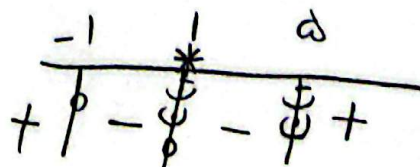
$D_f = [1, 6]$

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



$D_f = (-\infty, 1) \cup (2, 5)$

ب) $\frac{x^2 - 1}{x^2 - 6x + 5} \geq 0 \rightarrow \frac{x^2 - 1}{(x-1)(x-5)} \geq 0$



$D_f = (-\infty, -1] \cup (5, +\infty)$

$$\text{ا) } y = \sqrt{\frac{x^3-1}{x^3-x}} \rightarrow \frac{x^3-1}{x^3-x} \geq 0 \rightarrow \begin{cases} x^3-1 \geq 0 \rightarrow x^3 \geq 1 \rightarrow x \geq 1 \\ x^3-x > 0 \rightarrow x^3 > x \end{cases}$$

-1, 1, 0

$$\begin{array}{c} -1 \quad 0 \quad 1 \\ + \quad - \quad + \end{array}$$

$$D_f = (-\infty, -1) \cup (0, +\infty) - \{1\}$$

$$\text{ب) } y = \sqrt{\frac{x^2-16}{x^2-5x+4}} \rightarrow \frac{x^2-16}{(x-1)(x-4)} \geq 0$$

$$\begin{array}{c} -4 \quad -1 \quad 4 \\ + \quad - \quad + \end{array}$$

$$D_f = (-\infty, -4] \cup (1, +\infty) - \{4\}$$

$$\text{ا) } y = \sqrt{4-\sqrt{4-x}} \rightarrow \begin{cases} 4-x \geq 0 \rightarrow x \leq 4 \\ 4-\sqrt{4-x} \geq 0 \rightarrow \sqrt{4-x} \leq 4 \rightarrow 4-x \leq 16 \rightarrow x \geq -12 \end{cases}$$

$$D_f = [-12, 4]$$

$$\text{ب) } y = \sqrt{3-\sqrt{x-2}} \rightarrow \begin{cases} x-2 \geq 0 \rightarrow x \geq 2 \\ 3-\sqrt{x-2} \geq 0 \rightarrow \sqrt{x-2} \leq 3 \rightarrow x-2 \leq 9 \rightarrow x \leq 11 \end{cases}$$

$$D_f = [2, 11]$$

$$\text{ا) } y = \sqrt{4-2x^2} \rightarrow 4-2x^2 \geq 0 \rightarrow 2x^2 \leq 4 \rightarrow x^2 \leq 2 \rightarrow -\sqrt{2} \leq x \leq \sqrt{2}$$

$$D_f = [-\sqrt{2}, \sqrt{2}]$$

$$\text{ب) } y = \sqrt{3|x|-9} \rightarrow 3|x|-9 \geq 0 \rightarrow 3|x| \geq 9 \rightarrow |x| \geq 3 \rightarrow \begin{cases} x \geq 3 \\ x \leq -3 \end{cases}$$

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

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

$D_f = \mathbb{R} - \{-3, 3\}$

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ب) $y = \sqrt[3]{\frac{\sqrt{x}+1}{\sqrt{x}-3}} \neq 0 \rightarrow \sqrt{x} \neq 3 \rightarrow x \neq 9$

$D_f = \mathbb{R} - \{9\}$

الف) $\frac{\sin x}{x \cos x - 1} \neq 0 \rightarrow x \cos x \neq 1 \rightarrow \cos x \neq \frac{1}{x}$



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

ب) $\frac{\cos x + 1}{x \sin x + 1} \neq 0 \rightarrow x \sin x \neq -1 \rightarrow \sin x \neq \frac{-1}{x}$



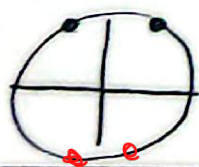
$D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}, 2k\pi - \frac{\pi}{2}\}$

ج) $\frac{\tan x + 1}{x \cot x - 1} \rightarrow \frac{\frac{\sin x}{\cos x} + 1}{\frac{\cos x}{\sin x} - 1} \rightarrow \frac{\cos x}{\sin x} \neq 1, \sin \neq 0, \cos \neq 0$



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

د) $y = \frac{\sin x + 1}{x \sin^2 x - 3} \neq 0 \rightarrow x \sin^2 x \neq 3 \rightarrow \sin^2 x \neq \frac{3}{x} \rightarrow \sin x \neq \pm \sqrt{\frac{3}{x}}$



$D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}\}$

$y = \frac{1}{\sqrt{x-2} - \frac{1}{x}}$

$\sqrt{x-2} - \frac{1}{x} \geq 0 \rightarrow \sqrt{x-2} \geq \frac{1}{x} \rightarrow |x-2| \geq \frac{1}{x^2} \rightarrow \begin{cases} x-2 \geq \frac{1}{x^2} \rightarrow x \geq 2 + \frac{1}{x^2} \\ -x+2 \geq \frac{1}{x^2} \rightarrow x \leq 2 - \frac{1}{x^2} \end{cases}$

$D_f = (-\infty, 2 - \frac{1}{x^2}] \cup [2 + \frac{1}{x^2}, +\infty)$

$$\text{الف) } y = \sqrt{4 - 2|x|} \Rightarrow 4 - 2|x| \geq 0 \Rightarrow 2|x| \leq 4 \rightarrow |x| \leq 2 \rightarrow -2 \leq x \leq 2$$

$$D_f = [-2, 2]$$

لذا

✓

$$\text{ب) } y = \sqrt{\frac{|x|}{|x|}} \rightarrow x \neq 0 \quad D_f = \mathbb{R} - \{0\}$$