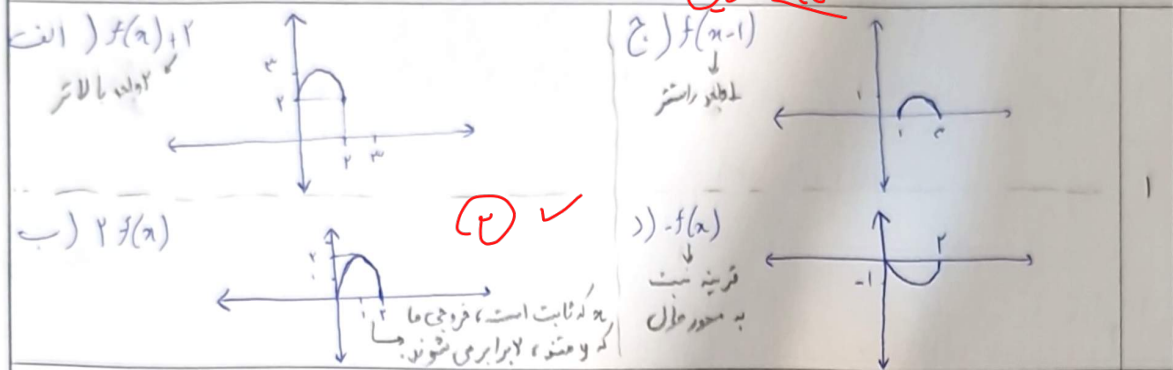


۵-۲ آفرین



الف) $x^2 - 5x + 4 > 0 \rightarrow (x-4)(x-1) \rightarrow \leftarrow \begin{array}{c} 2 \\ + \quad - \quad + \\ 1 \quad 4 \end{array} \rightarrow (-\infty, 1) \cup (4, +\infty)$

ب) $x^2 - 4x + 5 > 0 \rightarrow (x-2)(x-1) \rightarrow \leftarrow \begin{array}{c} 1 \\ + \quad - \quad + \\ 1 \quad 2 \end{array} \rightarrow (1, 2) \quad \text{✓}$

ج) $x^2 + 4x + 5 \geq 0 \rightarrow (x+1)(x+5) \rightarrow \leftarrow \begin{array}{c} -5 \\ + \quad - \quad + \\ -1 \quad -5 \end{array} \rightarrow (-\infty, -5] \cup [-1, +\infty)$

د) $x^2 - 7x + 4 \leq 0 \rightarrow (x-4)(x-1) \rightarrow \leftarrow \begin{array}{c} 1 \\ + \quad - \quad + \\ 1 \quad 4 \end{array} \rightarrow [1, 4]$

الف) $\frac{x^2 - 3x + 2}{x - 5} < 0$

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

الف) $\frac{x^2 - 1}{x^2 - x} \geq 0$

ب) $\frac{x^2 - 14}{x^2 - 5x + 4} \geq 0$

الف) $\sqrt{2-x} \geq 0 \rightarrow 2-x \geq 0 \rightarrow x \leq 2$

ب) $\sqrt{2-x} \geq 0 \rightarrow 2-x \geq 0 \rightarrow x \leq 2$

$$\text{ا) } \sqrt{4-x^2} \rightarrow 4-x^2 \geq 0 \Rightarrow x^2 \leq 4 \Rightarrow x \geq -2, x \leq 2 \Rightarrow D_f = [-2, 2]$$

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

✓

$$\text{ب) } \sqrt{x^2-9} \rightarrow x^2-9 \geq 0 \Rightarrow x^2 \geq 9 \Rightarrow |x| \geq 3 \Rightarrow x \geq 3, x \leq -3$$

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

$$\text{ا) } \frac{|x+1|}{|x-2|}$$

$$|x-2| \neq 0 \Rightarrow x \neq 2 \Rightarrow D_f = \mathbb{R} - \{2\}$$

$$D_f = \mathbb{R} - \{2\}$$

$$\text{ب) } \frac{\sqrt{x+1}}{(\sqrt{x})^2-9}$$

$$\sqrt{x+1} \neq 0 \Rightarrow x \neq -1 \Rightarrow D_f = [0, +\infty) - \{-1\}$$

$$x \geq 0$$

$$\text{ا) } \frac{\sin x}{\cos x - 1}$$

$$\cos x - 1 \neq 0 \Rightarrow \cos x \neq 1 \Rightarrow x \neq 2k\pi, k \in \mathbb{Z} \Rightarrow D_f = \mathbb{R} - \{2k\pi, k \in \mathbb{Z}\}$$

$$\text{ب) } \frac{\cos x + 1}{\sin x + 1}$$

$$\sin x + 1 \neq 0 \Rightarrow \sin x \neq -1 \Rightarrow x \neq \frac{3\pi}{2} + 2k\pi, k \in \mathbb{Z} \Rightarrow D_f = \mathbb{R} - \{\frac{3\pi}{2} + 2k\pi, k \in \mathbb{Z}\}$$

$$\text{ج) } \frac{\tan x + 1}{\cot x - 1}$$

$$\cot x - 1 \neq 0 \Rightarrow \cot x \neq 1 \Rightarrow x \neq \frac{\pi}{4} + k\pi, k \in \mathbb{Z} \Rightarrow D_f = \mathbb{R} - \{\frac{\pi}{4} + k\pi, k \in \mathbb{Z}\}$$

$$\text{د) } \frac{\sin x + 1}{\sin^2 x - 9}$$

$$\sin^2 x - 9 \neq 0 \Rightarrow \sin^2 x \neq 9 \Rightarrow \sin x \neq \pm 3 \Rightarrow D_f = \mathbb{R} - \{k\pi + \frac{\pi}{2}, k\pi + \frac{3\pi}{2}, k \in \mathbb{Z}\}$$

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

$$\sqrt{|x-2| - \frac{1}{2}} > 0 \Rightarrow |x-2| > \frac{1}{2} \Rightarrow x > \frac{5}{2}, x < \frac{3}{2}$$

$$D_f = x > \frac{5}{2}, x < \frac{3}{2} \Rightarrow D_f = (-\infty, \frac{3}{2}) \cup (\frac{5}{2}, +\infty)$$

$$x-2 > \frac{1}{2} \Rightarrow x > \frac{5}{2}$$

$$x-2 < -\frac{1}{2} \Rightarrow x < \frac{3}{2}$$

✓

$$\text{ا) } y = \sqrt{4-2|x|} \Rightarrow 4-2|x| \geq 0 \Rightarrow x^2 \leq 2 \Rightarrow x \geq -\sqrt{2}, x \leq \sqrt{2} \Rightarrow D_f = [-\sqrt{2}, \sqrt{2}]$$

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

$$\text{ب) } y = \sqrt{\frac{|x|}{|x|}}$$

$$\frac{|x|}{|x|} \geq 0 \Rightarrow x \neq 0 \Rightarrow D_f = \mathbb{R} - \{0\}$$

$$|x| \neq 0 \Rightarrow x \neq 0$$

$$+ \rightarrow +$$

$$0 \rightarrow 0$$

$$- \rightarrow -$$

✓