

د) $y = \frac{\sin^2 x + 1}{\epsilon \sin^2 x - 1}$



$\epsilon \sin^2 x - 1 \neq 0$

$\epsilon \sin^2 x \neq 1$

$\sin^2 x \neq \frac{1}{\epsilon}$

$\sin x \neq \pm \frac{1}{\sqrt{\epsilon}}$

$x \neq \cos^{-1} \frac{1}{\sqrt{\epsilon}}, \sin^{-1} \frac{1}{\sqrt{\epsilon}}, \pi - \cos^{-1} \frac{1}{\sqrt{\epsilon}}, \pi + \sin^{-1} \frac{1}{\sqrt{\epsilon}}$

$\frac{\pi}{2}, \frac{3\pi}{2}, \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$

$\Rightarrow D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{2}, k\pi + \frac{3\pi}{2} \right\}$
 $= \left\{ k\pi \pm \frac{\pi}{6} \right\}$

سوال دوم

$y = \frac{1}{\sqrt{2|x-2| - \frac{1}{4}}}$

$\Rightarrow 2|x-2| - \frac{1}{4} > 0$

$2|x-2| > \frac{1}{4}$

$D_f = \left(\frac{9}{8}, +\infty \right) \cup \left(-\infty, \frac{1}{8} \right) \mid 2|x-2| > \frac{1}{4}$

$x-2 < -\frac{1}{8} \quad \text{or} \quad x-2 > \frac{1}{8}$

$x < \frac{15}{8} \quad \text{or} \quad x > \frac{17}{8}$

$x < \frac{15}{8}$

$x > \frac{17}{8}$

سوال سوم

الف) $y = \sqrt{\epsilon - 2|x|}$

ب) $y = \sqrt{\frac{|x|}{|x|}}$

$\epsilon - 2|x| \geq 0$

$2|x| \leq \epsilon$

$|x| \leq \frac{\epsilon}{2}$

$|x| \neq 0$

$x \neq 0$

$\frac{|x|}{|x|} \gg 0 \quad \checkmark$

$D_f = \mathbb{R} - \{0\}$

$D_f = -\frac{\epsilon}{2} \leq x \leq \frac{\epsilon}{2}$

سوال چهارم

$y = \sqrt{\epsilon - 2x^2}$

$\epsilon - 2x^2 \geq 0 \Rightarrow 2(\sqrt{\epsilon} - x)(\sqrt{\epsilon} + x) \geq 0$

$-\sqrt{\epsilon} \leq x \leq \sqrt{\epsilon}$

$\Rightarrow D_f = [-\sqrt{\epsilon}, \sqrt{\epsilon}]$

$$c) y = \sqrt{|x| - 9}$$

$$|x| - 9 \geq 0$$

(2)

$$|x| \geq 9 \Rightarrow |x| \geq 9 \Rightarrow x \geq 9 \text{ or } x \leq -9$$

$$D_f = [-9, +\infty) \cup (-\infty, -9]$$

✓

* 1) $y = \sqrt{\frac{n+1}{n-1}} \Rightarrow D_f = \mathbb{R} - \{\pm 1\}$

$\sqrt{n-1} \neq 0$

$\sqrt{n} \neq 1$

$n \neq \pm 1$

1, 1/2

سوال مستقیم

2) $y = \frac{\sin n}{y \cos n - 1}$



$y \cos n - 1 \neq 0$

$y \cos n \neq 1$

$\cos n \neq \frac{1}{y}$

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

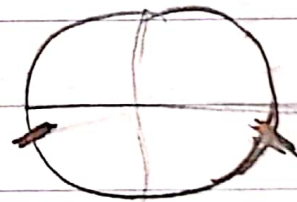
$n \neq \frac{\pi}{y}, \frac{2\pi}{y}$

3) $y = \frac{\cos n + 1}{y \sin n + 1} \Rightarrow y \sin n + 1 \neq 0$

$y \sin n \neq -1$

$\sin n \neq -\frac{1}{y}$

$n \neq \frac{3\pi}{2}, \frac{5\pi}{2}$



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

1, 1/2

4) $y = \frac{\tan n + 1}{\cot n - 1} \Rightarrow \cot n - 1 \neq 0$

$\cot n \neq 1$

$n \neq \frac{\pi}{4}, \frac{5\pi}{4}$

$\tan n = \frac{\sin n}{\cos n}$

$\sin n \neq 0$

$\cos n \neq 0$

$n \neq \frac{\pi}{2}, \frac{3\pi}{2}$

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



$$\div) \sqrt{\frac{x^2-14}{x^2-\infty+\epsilon}} \Rightarrow \begin{array}{l} x^2-4x=0 \\ x^2=14 \\ x=\sqrt{14} \\ x=-\sqrt{14} \end{array}$$

$(x-1)(x-\epsilon)$
 $\begin{array}{ccccc} & -\epsilon & 1 & \epsilon & \epsilon^* \end{array}$

$$\Rightarrow \begin{array}{c} x \\ | \quad | \quad | \quad | \quad | \\ + \quad - \quad - \quad + \quad + \end{array} \Rightarrow Df = (-\infty, -\epsilon] \cup (1, \epsilon) \cup (\epsilon, +\infty)$$

سوال بنیم ←

$$\text{الف) } \sqrt{\epsilon - \sqrt{2-x}}$$

$$\epsilon - \sqrt{2-x} > 0$$

$$2-x > 0$$

$$\epsilon > \sqrt{2-x}$$

$$14 > 2-x$$

$$\Rightarrow Df = [-1, 2]$$

$$(x > -1, \epsilon)$$

(✓)

$$\text{ب) } \sqrt{3 - \sqrt{x-2}}$$

$$3 - \sqrt{x-2} > 0$$

$$x-2 > 0$$

$$\sqrt{x-2} < 3$$

$$x > 2$$

$$x-2 < 9$$

$$\Rightarrow Df = [2, 11]$$

$$(x < 11)$$

سوال هفتم ←

$$\text{الف) } y = \sqrt[3]{\frac{|x|+1}{|x|-3}} \Rightarrow Df = \mathbb{R} - \{\pm 3\}$$

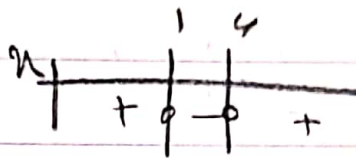
$$|x|-3 \neq 0$$

$$|x| \neq 3$$

$$x \neq -3, 3$$

$$\Rightarrow x^2 - 5x + 4 < 0$$

$$(x-1)(x-4) < 0 \Rightarrow$$



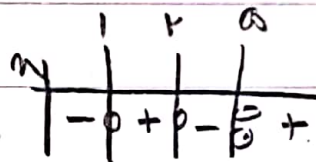
$$Pf \Rightarrow [1, 4]$$

$$(x-1)(x-4)$$

← pseudo

$$Cv) x^2 - 5x + 4 < 0 \Rightarrow$$

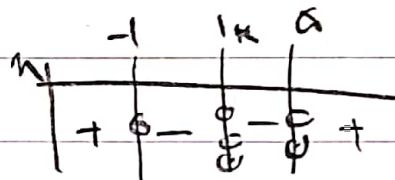
$$\frac{x-5}{x-4}$$



$$Pf \Rightarrow (-\infty, 4) \cup (5, \infty)$$

$$Cv) \frac{x^2-1}{x^2-4x+4} > 0$$

$$\Rightarrow$$



$$x^2-1=0$$

$$x^2=1$$

$$x=\pm 1$$

$$(x-1)(x-4)$$

$$\Rightarrow Pf = (-\infty, -1] \cup (4, +\infty)$$

← pseudo

$$Cv) \sqrt{\frac{x^2-1}{x^2-x}} \Rightarrow x^2-1=0$$

$$x^2=1$$

$$x=\pm 1$$

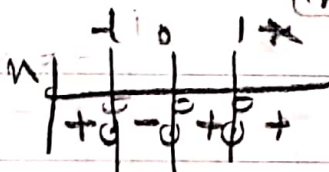
$$x^2-x=0$$

$$x(x^2-x)=0$$

$$x=0 \text{ or } x^2-1=0$$

$$x^2=1$$

$$x=\pm 1$$

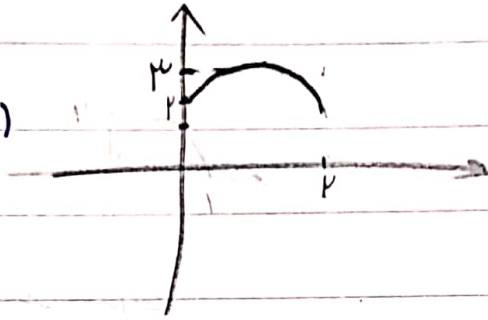


$$\Rightarrow$$

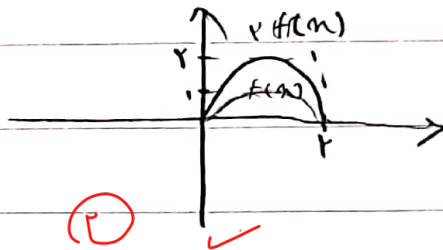
$$\Rightarrow Pf = \mathbb{R} - [-1, 0] \cup \{1\}$$

سوال اول ←

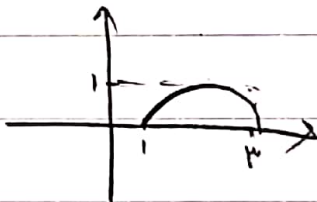
الف)



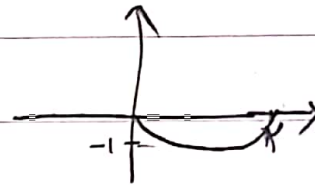
ب)



ج)



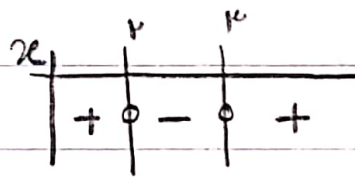
د)



سوال دوم ←

$$\text{الف) } x^2 - 5x + 4 > 0$$

$$(x-1)(x-4) > 0 \Rightarrow$$

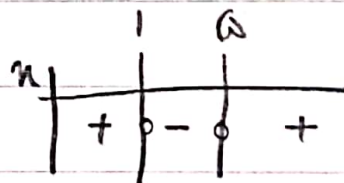


$$\Rightarrow (-\infty, 1) \cup (4, +\infty)$$

Df =

$$\text{ب) } x^2 - 4x + 4 < 0$$

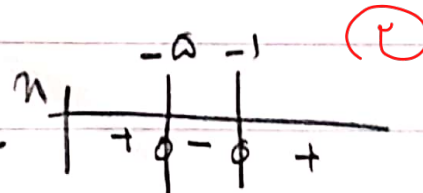
$$(x-1)(x-4) < 0 \Rightarrow$$



$$Df \Rightarrow (1, 4)$$

$$\text{ج) } x^2 + 4x + 4 > 0$$

$$(x+1)(x+4) > 0$$



$$Df \Rightarrow (-\infty, -4] \cup [-1, +\infty)$$