



الف)  $f(x) = (-x^2) \Rightarrow f(x) + 2 \rightarrow$

ب)  $2f(x) \rightarrow$

ج)  $f(x-1) \rightarrow$

د)  $-f(x) \rightarrow$

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

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

ج)  $x^2 + 4x + 5 \geq 0 \rightarrow (x+1)(x+5) \geq 0$

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

|   |   |
|---|---|
| 2 | 3 |
| + | - |
| 0 | 0 |
| + | + |

$D = (-\infty, 1) \cup (4, +\infty)$

|   |   |   |
|---|---|---|
| + | - | + |
| 0 | 0 | 0 |
| + | - | + |

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

|   |   |   |
|---|---|---|
| + | - | + |
| 0 | 0 | 0 |
| + | - | + |

$D = [1, 4]$

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

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

|   |   |   |
|---|---|---|
| 1 | 2 | 5 |
| - | + | - |
| 0 | 0 | 0 |
| - | + | - |

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

|    |   |   |
|----|---|---|
| -1 | 1 | 5 |
| +  | - | + |
| 0  | 0 | 0 |
| +  | - | + |

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

الف)  $y = \sqrt{\frac{x^3 - 1}{x^3 - x}} \rightarrow \frac{x^3 - 1}{x^3 - x} \geq 0$

~~$\frac{x^3 - 1}{x^3 - x} \geq 0$~~

$x^3 - x \neq 0 \rightarrow x(x^2 - 1) \neq 0$

|    |   |   |
|----|---|---|
| -1 | 0 | 1 |
| +  | - | + |
| 0  | 0 | 0 |
| +  | - | + |

$D = (-\infty, -1) \cup (0, 1) \cup (1, +\infty)$

ب)  $y = \sqrt{\frac{x^2 - 14}{x^2 - 5x + 6}} \rightarrow \frac{x^2 - 14}{x^2 - 5x + 6} \geq 0$

|   |   |   |
|---|---|---|
| + | - | + |
| 0 | 0 | 0 |
| + | - | + |

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

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

$2 - \sqrt{2-x} \geq 0 \rightarrow 2 \geq \sqrt{2-x} \rightarrow 2 \geq \sqrt{2-x} \rightarrow 4 \geq 2-x$

$\Rightarrow x \geq -12$

$\rightarrow D = [-12, 2]$

ب)  $\sqrt{3 - \sqrt{x-2}} \rightarrow x-2 \geq 0 \rightarrow x \geq 2$

$3 - \sqrt{x-2} \geq 0 \rightarrow 3 \geq \sqrt{x-2} \rightarrow 9 \geq x-2 \Rightarrow x \leq 11$

$\rightarrow D = [2, 11]$

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

$$\text{ب) } \sqrt{3|x|-9} \rightarrow 3|x| \geq 9 \rightarrow |x| \geq 3 \xrightarrow{x \in \mathbb{R}} [3, +\infty) \cup (-\infty, -3] \cup [3, +\infty)$$

$$\text{الف) } y = \sqrt{\frac{|x|+1}{|x|-3}} \xrightarrow{\text{راديكال بي تاثير است}} |x|-3 \neq 0 \rightarrow |x| \neq 3 \rightarrow x = \pm 3$$

$$\rightarrow D = \mathbb{R} - \{3, -3\}$$

$$\text{ب) } y = \sqrt{\frac{\sqrt{x}+1}{\sqrt{x}-3}} \xrightarrow{\text{راديكال بي تاثير است}} \sqrt{x}-3 \neq 0 \rightarrow \sqrt{x} \neq 3 \rightarrow x \neq 9 \Rightarrow D = [0, +\infty) - \{9\}$$

$$\text{الف) } y = \frac{\sin x}{2\cos x - 1} \rightarrow 2\cos x - 1 \neq 0 \rightarrow 2\cos x \neq 1 \rightarrow \cos x \neq \frac{1}{2} \rightarrow D = \mathbb{R} - \{2k\pi + \frac{\pi}{3}, 2k\pi - \frac{\pi}{3}\}$$

$$\text{ب) } y = \frac{\cos x + 1}{2\sin x + 1} \rightarrow 2\sin x + 1 \neq 0 \rightarrow \sin x \neq -\frac{1}{2} \rightarrow D = \mathbb{R} - \{2k\pi + \frac{7\pi}{6}, 2k\pi + \frac{5\pi}{6}\}$$

$$\text{ج) } y = \frac{\tan x + 2}{\cot x - 1} \rightarrow \cot x - 1 \neq 0 \rightarrow \cot x \neq 1 \rightarrow D = \mathbb{R} - \{k\pi + \frac{\pi}{4}, k\pi + \frac{5\pi}{4}\}$$

$$\text{د) } y = \frac{\sin^2 x + 1}{2\sin^2 x - 3} \rightarrow 2\sin^2 x - 3 \neq 0 \rightarrow \sin^2 x \neq \frac{3}{2} \rightarrow \sin x \neq \pm \frac{\sqrt{3}}{2} \rightarrow D = \mathbb{R} - \{2k\pi + \frac{\pi}{3}, 2k\pi + \frac{2\pi}{3}, 2k\pi + \frac{4\pi}{3}, 2k\pi + \frac{5\pi}{3}\}$$

$$y = \frac{1}{\sqrt{2|x-2| - \frac{1}{2}}} \rightarrow 2|x-2| - \frac{1}{2} > 0 \rightarrow 2|x-2| > \frac{1}{2} \rightarrow |x-2| > \frac{1}{4}$$

$$\rightarrow x \in \mathbb{R}^+ \rightarrow D = (2, 2.25) \cup (2.25, +\infty)$$

$$\rightarrow x \in \mathbb{R}^- \rightarrow D = (-\infty, 1.75) \cup (1.75, 2)$$

$$\text{الف) } y = \sqrt{4-2|x|} \rightarrow 4-2|x| \geq 0 \rightarrow |x| \leq 2 \xrightarrow{x=0} \checkmark \quad x \in \mathbb{R}^+ \rightarrow [0, 2]$$

$$x \in \mathbb{R}^- \rightarrow [-2, 0] \rightarrow D = [-2, 0] \cup [0, 2]$$

$$\text{ب) } y = \sqrt{\frac{|x|}{|x|}} \rightarrow \text{همیشه مثبت} \Rightarrow D = \mathbb{R} - \{0\}$$