

الف) $y = \frac{x+4}{x^3-2x^2+3x-6} \rightarrow x+1, \frac{3}{x}, \frac{6}{x} \Rightarrow D_f = \mathbb{R} - \left\{1, \frac{3}{x}, \frac{6}{x}\right\}$

جمع ضرایب منفرجه

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ب) $y = \frac{x+3}{3x^3-x^2-8x-4} \rightarrow x+1, 2, -\frac{2}{3} \Rightarrow D_f = \mathbb{R} - \left\{-1, 2, -\frac{2}{3}\right\}$

جمع ضرایب توان فرد = جمع ضرایب توان زوج

الف) $y = \frac{x+1}{x-\sqrt{3-2x}} \rightarrow 3-2x \geq 0 \rightarrow x \leq \frac{3}{2}$

$x \neq \sqrt{3-2x} \rightarrow x^2 \neq 3-2x \rightarrow x^2+2x-3 \neq 0 \rightarrow (x+3)(x-1) \neq 0 \rightarrow x \neq 1, -3$

$\Rightarrow D_f = (-\infty, \frac{3}{2}] - \{1\}$

در معادله جواب می دهد

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ب) $y = \frac{x+2}{x-\sqrt{3x-2}} \rightarrow 3x-2 \geq 0 \rightarrow x \geq \frac{2}{3}$

$x \neq \sqrt{3x-2} \rightarrow x^2 \neq 3x-2 \rightarrow x^2-3x+2 \neq 0 \rightarrow (x-1)(x-2) \neq 0 \rightarrow x \neq 1, 2$

$\Rightarrow D_f = [\frac{2}{3}, +\infty) - \{1, 2\}$

الف) $y = \frac{\sin x}{2\cos x - 1} \rightarrow 2\cos x - 1 \neq 0 \rightarrow \cos x \neq \frac{1}{2} \Rightarrow D_f = \mathbb{R} - \{2k\pi \pm \frac{\pi}{3}\}$

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

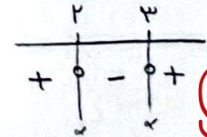
ج) $y = \frac{\tan x + 1}{\cot x - 1} \rightarrow \sin x, \cos x \neq 0, \cot x - 1 \neq 0 \rightarrow \cot x \neq 1 \Rightarrow D_f = \mathbb{R} - \{\frac{k\pi}{2}, k\pi + \frac{\pi}{4}\}$

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

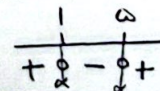
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الف) $x^2-5x+6 > 0 \rightarrow (x-2)(x-3) > 0 \Rightarrow D_f = (-\infty, 2) \cup (3, +\infty)$



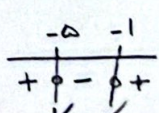
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ب) $x^2-6x+5 < 0 \rightarrow (x-1)(x-5) < 0 \Rightarrow D_f = (1, 5)$

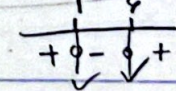


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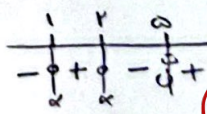
ج) $x^2+6x+5 \geq 0 \rightarrow (x+1)(x+5) \geq 0 \Rightarrow D_f = (-\infty, -5] \cup [-1, +\infty)$



د) $x^2-7x+6 \leq 0 \rightarrow (x-1)(x-6) \leq 0 \Rightarrow D_f = [1, 6]$

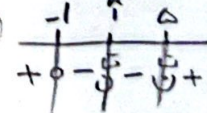


الف) $\frac{x^2-3x+2}{x-5} < 0 \rightarrow \frac{(x-1)(x-2)}{x-5} < 0 \Rightarrow D_f = (-\infty, 1) \cup (2, 5)$



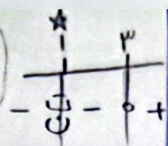
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ب) $\frac{x^2-1}{x^2-6x+5} \geq 0 \rightarrow \frac{(x-1)(x+1)}{(x-1)(x-5)} \geq 0 \Rightarrow D_f = (-\infty, -1] \cup (5, +\infty)$



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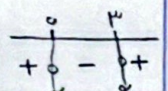
$$\text{الف) } y = \sqrt{\frac{x^2 - 3x + 3}{x^2 - 1}} = \sqrt{\frac{(x-1)(x-3)}{(x-1)(x^2 + x + 1)}} \sim \frac{(x-1)(x-3)}{(x-1)(x^2 + x + 1)} \geq 0 \rightarrow D_f = [3, +\infty)$$



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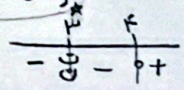
$$\text{ب) } y = \sqrt{\frac{x^2 - 3x + 3}{x^2 - 1}} \rightarrow x^2 - 1 \neq 0 \rightarrow (x-1)(x+1) \neq 0 \rightarrow x \neq \pm 1 \rightarrow D_f = \mathbb{R} - \{\pm 1\}$$

$$\text{الف) } y = \log(x^2 - 3x) \rightarrow x^2 - 3x > 0 \rightarrow x(x-3) > 0 \rightarrow D_f = (-\infty, 0) \cup (3, +\infty)$$



$$\text{ب) } y = \log \frac{14 - x^2}{|x| - 2} \rightarrow \begin{cases} 14 - x^2 > 0 \rightarrow (x-4)(x+4) > 0 \rightarrow x = (-4, 4) \\ |x| - 2 > 0 \rightarrow x > 2, x < -2 \\ |x| - 2 \neq 0 \rightarrow x \neq \pm 2 \end{cases} \Rightarrow D_f = (-4, -2) \cup (2, 4) - \{\pm 2\}$$

$$\text{ج) } y = \log \frac{x^2 - \sqrt{x+1}}{1-x} \rightarrow \begin{cases} \frac{x^2 - \sqrt{x+1}}{1-x} > 0 \rightarrow \frac{(x-3)(x-1)}{1-x} > 0 \rightarrow (1, +\infty) \\ 1-x > 0 \rightarrow x < 1 \\ 1-x \neq 0 \rightarrow x \neq 1 \end{cases} \Rightarrow D_f = (1, 10) - \{9\}$$



$$\text{د) } y = \sqrt{x^2 - 11x + 28} + \log \frac{\sqrt{14 - x^2}}{x} \rightarrow \begin{cases} \sqrt{14 - x^2} > 0 \rightarrow 14 - x^2 > 0 \rightarrow (x-4)(x+4) > 0 \rightarrow x = (-4, 4) \\ x > 0 \\ x \neq 1 \end{cases} \Rightarrow D_f = (0, 4] - \{1\}$$

$$y = \frac{x^2 - x}{x^2 + x} = \frac{x(x-1)}{x(x+1)} \rightarrow \begin{matrix} -1 & 0 & 1 \\ + & - & + \end{matrix}$$

x	-1	0	1
$\frac{x^2 - x}{x^2 + x}$	+	-	+
$\frac{x^2 + x}{x^2 - x}$	+	-	+
$\frac{x^2 - x}{x^2 + x}$	+	-	+

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

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

$$y = \sqrt{\frac{x - f(x)}{f(x)}} \rightarrow \frac{x - f(x)}{f(x)} \geq 0 \rightarrow x - f(x) = 0 \rightarrow x = f(x) \rightarrow x^2 - 1 \rightarrow D_f = (-1, -1] \cup (1, 3]$$

