

دامنه توابع زیر بدست آورید

الف) $y = \frac{x+2}{4x^3-20x^2+31x-15}$ $\Rightarrow 4x^3-20x^2+31x-15 \neq 0$ $\Rightarrow (x-1)(4x^2-16x+16) \neq 0$ $\Rightarrow (x-1)(2x-4)^2 \neq 0$ $\Rightarrow x \neq 1$ $\Rightarrow D_f = \mathbb{R} - \{1\}$

ب) $y = \frac{x+3}{3x^3-x^2-11x-6}$ $\Rightarrow 3x^3-x^2-11x-6 \neq 0$ $\Rightarrow (x+2)(3x^2-7x-3) \neq 0$ $\Rightarrow x \neq -2$ $\Rightarrow D_f = \mathbb{R} - \{-2\}$

الف) $y = \frac{x+1}{x-\sqrt{3}-2x}$ $\Rightarrow x-\sqrt{3}-2x \neq 0 \Rightarrow x \neq \sqrt{3}-2x \Rightarrow x^2 \neq \sqrt{3}-2x \Rightarrow x^2+2x-\sqrt{3} \neq 0$ $\Rightarrow (x+1)(x-\sqrt{3}) \neq 0$ $\Rightarrow x \neq -1$ $\Rightarrow x \neq \sqrt{3}$ $\Rightarrow D_f = (\mathbb{R} - \{-1, \sqrt{3}\}) \cup \{0\}$

ب) $y = \frac{x+2}{x-\sqrt{3x-2}}$ $\Rightarrow x-\sqrt{3x-2} \neq 0 \Rightarrow x \neq \sqrt{3x-2} \Rightarrow x^2 \neq 3x-2 \Rightarrow x^2-3x+2 \neq 0$ $\Rightarrow (x-1)(x-2) \neq 0$ $\Rightarrow x \neq 1$ $\Rightarrow x \neq 2$ $\Rightarrow D_f = (\mathbb{R} - \{1, 2\}) \cup \{0\}$

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

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

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

د) $y = \frac{\sin x + 1}{2\sin^2 x - 3}$ $\Rightarrow 2\sin^2 x - 3 \neq 0 \Rightarrow \sin^2 x \neq \frac{3}{2}$ $\Rightarrow D_f = \mathbb{R}$

الف) $x^2 - 5x + 4 > 0 \Rightarrow (x-1)(x-4) > 0$ $\Rightarrow x < 1$ or $x > 4$ $\Rightarrow D_f = (-\infty, 1) \cup (4, \infty)$

ب) $x^2 - 9x + 5 < 0 \Rightarrow (x-1)(x-5) < 0$ $\Rightarrow 1 < x < 5$ $\Rightarrow D_f = (1, 5)$

ج) $x^2 + 9x + 5 \geq 0 \Rightarrow (x+1)(x+5) \geq 0$ $\Rightarrow x \leq -5$ or $x \geq -1$ $\Rightarrow D_f = (-\infty, -5] \cup [-1, \infty)$

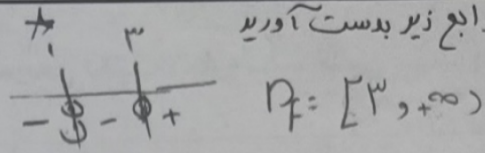
د) $x^2 - 7x + 4 \leq 0 \Rightarrow (x-1)(x-4) \leq 0$ $\Rightarrow 1 \leq x \leq 4$ $\Rightarrow D_f = [1, 4]$

الف) $\frac{x^2 - 3x + 2}{x^2 - 5x + 6} < 0$ $\Rightarrow \frac{(x-1)(x-2)}{(x-2)(x-3)} < 0$ $\Rightarrow \frac{x-1}{x-3} < 0$ $\Rightarrow 1 < x < 3$ $\Rightarrow D_f = (1, 3)$

ب) $\frac{x^2 - 1}{x^2 - 4x + 5} \geq 0 \Rightarrow \frac{(x-1)(x+1)}{(x-2)(x-3)} \geq 0$ $\Rightarrow x \leq 2$ or $x \geq 3$ $\Rightarrow D_f = (-\infty, 2] \cup [3, \infty)$

دامنه توابع زیر بدست آورید

الف) $\sqrt{\frac{x^2-4x+3}{x^3-1}} \geq 0 \rightarrow \sqrt{\frac{(x-1)(x-3)}{x^3-1}}$
 $x^3-1 \neq 0 \rightarrow x \neq 1$



۶

ب) $\sqrt{\frac{x^2-4x+3}{x^2-1}}$
 $x^2-1 \neq 0 \rightarrow x \neq \pm 1$

$D_f = \mathbb{R} - \{\pm 1\}$

دامنه توابع زیر حساب کنید
 الف) $y = \log(x^2-2x) \rightarrow x^2-2x > 0 \rightarrow x(x-2) > 0$
 $D_f = (-\infty, 0) \cup (2, +\infty)$

ب) $\log|x-2| > 0 \rightarrow (-\infty, -2) \cup (2, +\infty)$
 $D_f = (-\infty, -2) \cup (2, +\infty)$

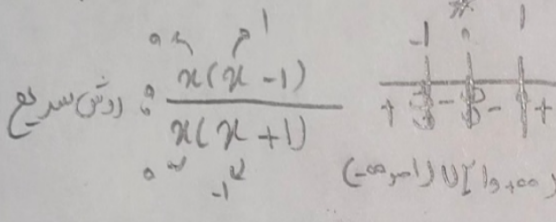
ج) $\log \frac{x^2-7x+3}{1-x} > 0 \rightarrow \frac{x^2-7x+3}{1-x} > 1 \rightarrow (x-4)(x-3) > 0, x \neq 1$
 $D_f = (-\infty, 3) \cup (4, +\infty)$

۷

د) $y = \sqrt{x^2-11x+21} + \log \frac{x^2-2x}{(x-7)(x-4)}$
 $D_f = (0, 4] \cup [7, +\infty)$

عبارت زیر به روش آیه قاضی و یک بار به روش صیغ علامت تجزیه کنید

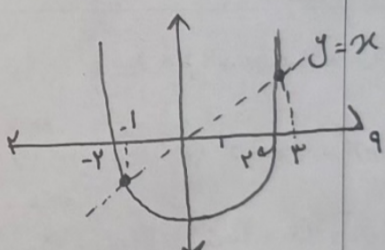
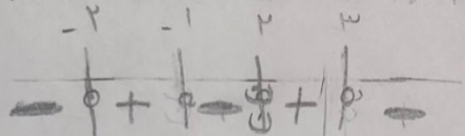
$y = \frac{x^2-x}{x^2+x}$



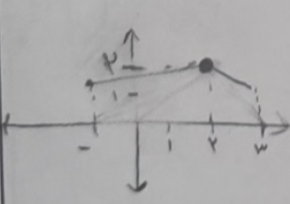
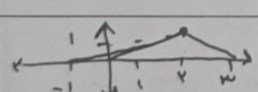
	-1	0	1	
$\frac{x^2-x}{x^2+x}$	+	+	-	+
$\frac{x^2+x}{x^2-x}$	+	-	+	+
D	+	-	-	+

۸

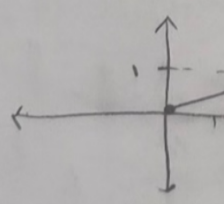
باقی به نمودار تابع خواسته شده حساب کنید
 $y = \sqrt{\frac{x-f(x)}{f(x)}} \rightarrow x-f(x) \geq 0 \rightarrow x \geq f(x)$
 $f(x) = x^2-1 \rightarrow x \geq x^2-1 \rightarrow x^2-x-1 \leq 0$
 $D_f = [-\frac{1}{2}, 1] \cup [2, 3]$



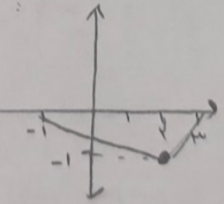
اگر $F(x)$ به شکل مقابل باشد نمودار تابع هارا رسم کنید



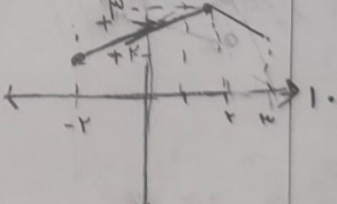
الف) $f(x)+1$



ب) $f(x)-1$



ج) $f(x)$



د) $f(x)+2$