اسمش ندارد

) $x^2-5x+6>0$

$\underbrace{(x-2)}_{2}\underbrace{(x-3)}_{3}>0$

$+ \quad 2 \quad - \quad 3 \quad +$

$D_f=(-\infty,2)\cup(3,+\infty)$

$x^2-6x+5<0$

$\underbrace{(x-5)}_{5}\underbrace{(x-1)}_{1}<0$

$+ \quad 1 \quad - \quad 5 \quad +$

$D_f=(1,5)$

) $x^2+6x+5\geq 0$

$\underbrace{(x+1)}_{-1}\underbrace{(x+5)}_{-5}\geq 0$

$+ \quad -5 \quad - \quad -1 \quad +$

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

) $x^2-7x+6\leq 0$

$\underbrace{(x-6)}_{6}\underbrace{(x-1)}_{1}\leq 0$

$+ \quad 1 \quad - \quad 6 \quad +$

$D_f=[1,6]$

۵-) $\dfrac{x^2-3x+2}{x-5}<0$

$\dfrac{\overbrace{(x-2)}^{2}\overbrace{(x-1)}^{1}}{\underbrace{x-5}_{5}}<0$

$- \quad 1 \quad + \quad 2 \quad - \quad 5 \quad +$

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

) $\dfrac{x^2-1}{x^2-6x+5}\geq 0$

$\dfrac{\overbrace{(x+1)}^{-1}\overbrace{(x-1)}^{1}}{\underbrace{(x-5)}_{5}\underbrace{(x-1)}_{1}}\geq 0$

ریشه مضاعف

$+ \quad -1 \quad - \quad 1 \quad - \quad 5 \quad +$

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

۶- الف) $y=\sqrt{\dfrac{x^2-4x+3}{x^2-1}}$

$\dfrac{x^2-4x+3}{x^2-1}\geq 0$

$\dfrac{\overbrace{(x-3)}^{3}\overbrace{(x-1)}^{1}}{x^2-1}\geq 0$

$- \quad 1 \quad - \quad 3 \quad +$

$D_f=[3,+\infty)$

ب) $y=\sqrt[3]{\dfrac{x^2-4x+3}{x^2-1}}$

$x^2-1\neq 0$

$x^2\neq 1$

$x\neq\pm 1$

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

۷- الف) $y=\log(x^2-3x)$

$x^2-3x>0$

$x(x-3)>0$

$+ \quad 0 \quad - \quad 3 \quad +$

$D_f=(-\infty,0)\cup(3,+\infty)$

ب) $y=\log_{|x|-2}^{16-x^2}$

$16-x^2>0$

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

$- \quad -4 \quad + \quad 4 \quad -$

$(-4,4)$ I

$|x|-2>0$ $\quad |x|>2$ $\quad x>2$, $x<-2$ II

$|x|-2\neq 1$ $\quad |x|\neq 3$ $\quad x\neq\pm 3$ III

$D_f=(-4,-2)\cup(2,4)-\{-3,3\}$

۷-

$$y=\log_{10-x}\frac{x^2-7x+12}{x-3}$$

$$\frac{x^2-7x+12}{x-3}>0 \qquad \frac{(x-4)(x-3)}{x-3}>0$$

$$\begin{array}{ccccc} & 3 & & 4 & \\ \hline & | & - & | & + \end{array}$$

$(4,+\infty)$ I

$10-x>0$

$x<10$ II

$10-x\neq 1 \qquad x\neq 9$

$D_f=(4,10)-\{9\}$

$$y=\sqrt{x^2-11x+28}+\log_x\sqrt{36-x^2}$$

$x^2-11x+28\geq 0$

$(x-4)(x-7)\geq 0$

$$\begin{array}{ccccc} & 4 & & 7 & \\ \hline + & | & - & | & + \end{array}$$

$(-\infty,4]\cup[7,+\infty)$ I

$36-x^2>0$

$x^2<36 \qquad -6<x<6$ II

$x>0$ III

$x\neq 1$

$D_f=(0,4]-\{1\}$

۸-

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

روش آپارتمانی

	-1	0	1	
x^2-x	+	+	−	+
x^2+x	+	−	+	+
$P(x)$	+	−	−	+

$$\frac{\overset{0}{x}\,\overset{1}{(x-1)}}{\underset{0}{x}\,\underset{-1}{(x+1)}}$$

روش سریع:

ریشه مضاعف

$$\begin{array}{ccccccc} & -1 & & 0 & & 1 & \\ \hline + & | & - & | & - & | & + \end{array}$$

۹-

ریشه‌های صورت و مخرج

$$y=\sqrt{\frac{x-f(x)}{f(x)}}$$

$x-f(x)=0$

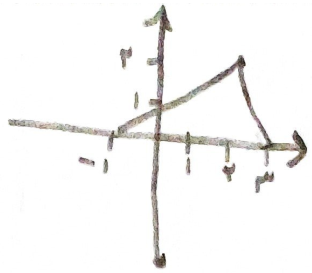
صورت $x=f(x)\Rightarrow x=-1,3$

مخرج $f(x)=0\Rightarrow x=-2,2$

$$\begin{array}{ccccccccc} & -2 & & -1 & & 2 & & 3 & \\ \hline + & | & - & | & + & | & - & | & + \end{array}$$

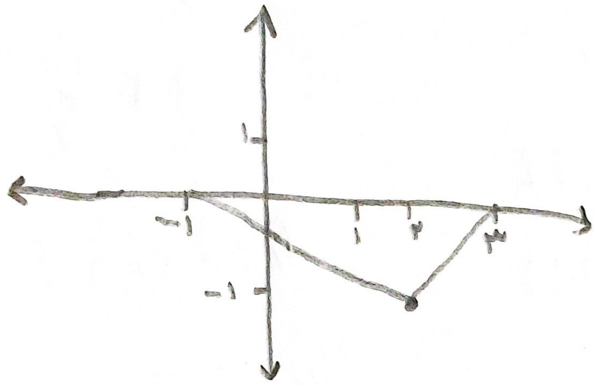
$D_f=(-\infty,-2)\cup[-1,2)\cup[3,+\infty)$

الف) $f(x)+1$

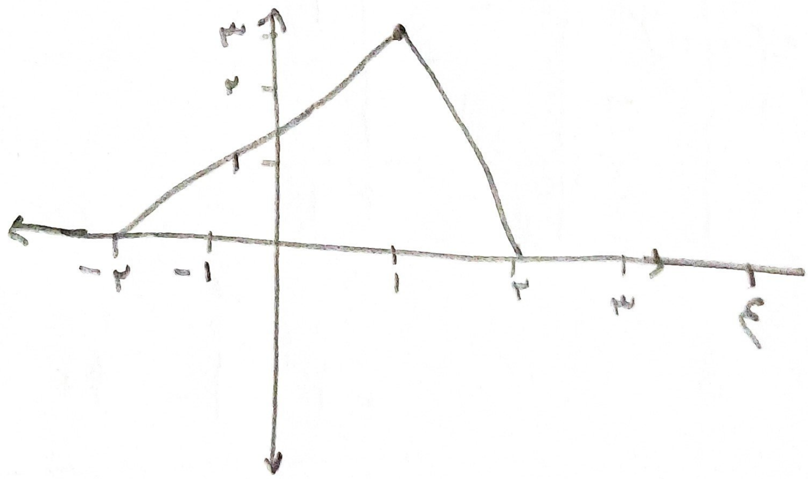


ب) $f(x-1)$

ج) $-f(x)$



د) $f(x+1)+۲$



-۱

الف) $y=\dfrac{x+3}{4x^3-20x^2+31x-15}$

$D_f=\mathbb{R}-\{1,\frac{3}{2},\frac{5}{2}\}$

جمع ضرایب = ۰ پس عبارت بر $x-1$ بخش‌پذیر است

ب) $y=\dfrac{x+3}{3x^3-x^2-8x-4}$

$y=\dfrac{x+3}{-(x+1)(3x^2-4x-4)}$

$D_f=\mathbb{R}-\{-1,2,-\frac{2}{3}\}$

$(x^2-4x-12)=(x-6)(x+2)$

$x=\frac{6}{3}=2$, $x=-\frac{2}{3}$

-۲

الف) $y=\dfrac{x+1}{x-\sqrt{3-2x}}$

$3-2x\geq 0$

$3\geq 2x$

$x\leq\frac{3}{2}$ I

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

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

$x^2\neq 3-2x \to x^2+2x-3\neq 0$

$(x+3)(x-1)\neq 0$

$x\neq 1$

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

ب) $y=\dfrac{x+2}{x-\sqrt{3x-2}}$

$3x-2\geq 0$ $3x\geq 2$ $x\geq\frac{2}{3}$ I

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

$x\neq\sqrt{3x-2}$ $x^2\neq 3x-2$

$x^2-3x+2\neq 0$

$(x-2)(x-1)\neq 0$

$x\neq 2,1$ II

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

-۳

الف) $y=\dfrac{\sin x}{2\cos x-1}$

$2\cos x-1\neq 0$ $2\cos x\neq 1$ $\cos x\neq\frac{1}{2}$

$D_f=\mathbb{R}-\{2k\pi+\frac{\pi}{3},2k\pi+\frac{5\pi}{3}\}$

ب) $y=\dfrac{\cos x+1}{2\sin x+1}$

$2\sin x+1\neq 0$ $2\sin x\neq -1$ $\sin x\neq -\frac{1}{2}$

$D_f=\mathbb{R}-\{2k\pi+\frac{7\pi}{6},2k\pi+\frac{11\pi}{6}\}$

ج) $y=\dfrac{\tan x+2}{\cot x-1}$

$\tan x=\dfrac{\sin x}{\cos x}$ $\cos x\neq 0$ I

$\cot x-1\neq 0$ $\cot x\neq 1$

$\cot x=\dfrac{\cos x}{\sin x}\to\sin x\neq 0$

$D_f=\mathbb{R}-\{\frac{k\pi}{2},k\pi+\frac{\pi}{4}\}$

د) $y=\dfrac{\sin x+1}{4\sin^2 x-3}$

$4\sin^2 x-3\neq 0$ $4\sin^2 x\neq 3$ $\sin^2 x\neq\frac{3}{4}$

$\sin x\neq\pm\frac{\sqrt{3}}{2}$

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