نام و نام خانوادگی: مرتضی شیرانی .... پاسخنامه تشریحی تکلیف شماره ۳ ...... کلاس یازدهم ریاضی A ....

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الف) $f(x)=\dfrac{x+3}{2x^3+3x^2-8x+3}=\dfrac{x+3}{(x-1)(2x^2+5x-3)}=\dfrac{x+3}{(x-1)(2)(x+3)(x-\frac{1}{2})}\rightarrow x\neq 1,-3,\frac{1}{2}$

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

ب) $f(x)=\dfrac{x+3}{2x^3+9x^2+10x+3}=\dfrac{x+3}{(x+1)(2x^2+7x+3)}=\dfrac{x+3}{(x+1)(2)(x+3)(x+\frac{1}{2})}\rightarrow x\neq -1,-3,-\frac{1}{2}$

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

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الف) $y=\dfrac{x+3}{x^3-2x^2+2x-1}\Longrightarrow x^3-2x^2+2x-1\neq 0\rightarrow (x+1)\underbrace{(x^2-x+1)}_{\text{همیشه مثبت}}\neq 0$

$\rightarrow x\neq 1\rightarrow D=\mathbb{R}-\{1\}$

ب) $y=\sqrt{\dfrac{x+3}{x^3-2x^2+2x-1}}\rightarrow \dfrac{x+3}{x^3-2x^2+2x-1}\geqslant 0\rightarrow \dfrac{x+3}{(x-1)(x^2-x+1)}\geqslant 0$

$\rightarrow$ (جدول تعیین علامت: -3 ، 1 : $+\ 0\ -\ \text{ت.ن}\ +$) $\rightarrow D_f=(-\infty,-3]\cup(1,+\infty)$

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$f(x)=\dfrac{2}{x^2-5|x-1|-2x+5}\rightarrow x^2-5|x-1|-2x+5\neq 0$

$\rightarrow\begin{cases} x-1\geqslant 0\rightarrow x\geqslant 1\rightarrow x^2-5x+5-2x+5\neq 0\rightarrow x^2-7x+10\neq 0\\ \quad\rightarrow (x-5)(x-2)\neq 0\rightarrow x\neq 2,5\xrightarrow{x\geqslant 1}\boxed{x\neq 2,5}\\ x-1<0\rightarrow x<1\rightarrow x^2+5x-5-2x+5\neq 0\rightarrow x^2+3x\neq 0\rightarrow x(x+3)\neq 0\\ \quad\rightarrow x\neq 0,-3\xrightarrow{x<1}\boxed{x\neq 0,-3}\end{cases}\rightarrow D_f=\mathbb{R}-\{-3,0,2,5\}$

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الف) $\dfrac{x+3}{|2x+1|-|x+3|}\rightarrow |2x+1|-|x+3|\neq 0$

$x<-3$	$-3\leqslant x<-\frac{1}{2}$	$x\geqslant -\frac{1}{2}$
$-2x-1+x+3=-x+2$	$-2x-1-x-3=-3x-4$	$2x+1-x-3=x-2$

$x\geqslant -\frac{1}{2},\ x-2\neq 0\rightarrow x\neq 2\checkmark$

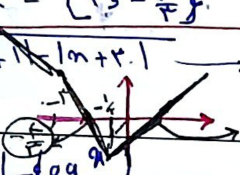
$-3\leqslant x\leqslant -\frac{1}{2}\rightarrow -3x-4\neq 0\rightarrow x\neq -\frac{4}{3}\checkmark$

$x<-3\rightarrow -x+2\neq 0\rightarrow \cancel{x\neq 2}$

$D_f=\mathbb{R}-\{2,-\frac{4}{3}\}$

ب) $y=\sqrt{|2x+1|-|x+3|}\rightarrow |2x+1|-|x+3|\geqslant 0$

$x<-3$	$-3\leqslant x<-\frac{1}{2}$	$x\geqslant -\frac{1}{2}$
$-2x-1+x+3=-x+2$	$-2x-1-x-3=-3x-4$	$2x+1-x-3=x-2$



$\rightarrow D_f=(-\infty,-\frac{4}{3})\cup(2,+\infty)$

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الف) $y=\log_2(1-\log_3 x)\longrightarrow x>0,\ 1-\log_3 x>0\rightarrow \log_3 x<1\rightarrow x<3$

$\rightarrow D_f:0<x<3\rightarrow D_f=(0,3)$

ج) $y=\log_2(1-\log_{\frac{1}{2}} x)\longrightarrow x>0,\ 1-\log_{\frac{1}{2}} x>0\rightarrow \log_{\frac{1}{2}} x<1\rightarrow x>\frac{1}{2}$

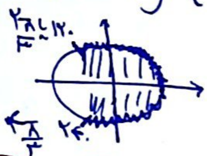
$\rightarrow D_f=(\frac{1}{2},+\infty)$

$f(x) = \sqrt{\log_{1/5} \log_5 (2x-1)} \longrightarrow ①\ 2x-1>0 \to x>\frac{1}{2}\ \Big\{\ ②\ \log_5 (2x-1) > 0 \to 2x-1>1$

$\longrightarrow 2x>2 \to x>1\ \Big\{\ ③\ \log_{1/5} \log_5 (2x-1) \geq 0 \to \log_5 (2x-1) \leq 1 \to 2x-1 \leq 5$ ۶

$\longrightarrow 2x \leq 6 \to x \leq 3 \xrightarrow{①\cap②\cap③} 1<x<3 \to D_f = (1\ \ 3]$

الف) $y = \log(2\cos x+1) \longrightarrow 2\cos x+1>0 \to 2\cos x>-1 \to \cos x>-\frac{1}{2}$



$\rightsquigarrow x = \left(2k\pi - \frac{2\pi}{3}\ ,\ 2k\pi + \frac{2\pi}{3}\right)$ ۷

ب) $y = \sqrt{\log \frac{x-1}{x+1}}$ $①\longrightarrow \frac{x-1}{x+1} > 0 \to$ $\begin{array}{ccccc} & -1 & & 1 & \\ + & & - & & + \end{array}$

$② \longrightarrow \log\frac{x-1}{x+1} \geq 0 \longrightarrow \frac{x-1}{x+1} \geq 1 \to \frac{x-1-x+1}{x+1} \geq 0 \to \frac{-2}{x+1} \geq 0$

$\longrightarrow \begin{array}{ccc} & -1 & \\ + & & - \end{array}$ $\xrightarrow{①\cap②} (-\infty\ \ -1)$

$f(x) = \sqrt{(a+2)x^2+ax+b}$ $\quad (a+2)x^2+ax+b \geq 0 \to \begin{array}{ccc} & 3 & \\ + & 0 & - \end{array}$

$\xrightarrow[\text{ا ریشه دارد}]{\text{جدول تعیین علامت}}$ معادله درجه ① $\longrightarrow a+2=0 \to a=-2 \to -2x+b \geq 0$ ۸

$\xrightarrow{x=3} -2(3)+b=0 \longrightarrow b=6$

$f(x) = \sqrt{x^2+2x+2-m^2} \quad D_f = \mathbb{R}$

$x^2+2x+2-m^2 \geq 0 \longrightarrow \Delta \leq 0 \to 4-4(2-m^2) \leq 0$ ۹

$\to 4-8+4m^2 \leq 0 \to -4+4m^2 \leq 0 \to 4m^2 \leq 4 \to m^2 \leq 1 \to -1 \leq m \leq 1$

$|1-(-1)| = 2$

$f(x) = \frac{\sqrt{4-x^2}}{[x]+[-x]+1} \xrightarrow{①} [x]+[-x]+1 \neq 0 \to \begin{cases} x\in\mathbb{Z} & [x]+[-x]=0 \\ x\notin\mathbb{Z} & [x]+[-x]=-1 \end{cases}$

$\longrightarrow \underline{x\in\mathbb{Z}}\ \Big\}\ ② \rightsquigarrow 4-x^2 \geq 0 \to x^2 \leq 4 \to -2 \leq x \leq 2$ ۱۰

$\longrightarrow x = \{-2, -1, 0, 1, 2\} \longrightarrow$ ۵ عدد صحیح