باران میرشاه‌ولایتی - شماره تکلیف ۳ - گروه یازدهم دختر C

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الف) $2x^3+3x^2-8x+3 \xrightarrow{\div\, x-1} \underbrace{2x^2+5x-3}_{} \xrightarrow{\text{ریشه}} x^2+5x-6=0$

$(x+6)(x-1)=0 \Rightarrow \frac{-6}{2}=-3 \,,\; \frac{1}{2} \Longrightarrow D_f=\mathbb{R}-\{-3, \frac{1}{2}, 1\}$

ب) $2x^3+9x^2+10x+3 \xrightarrow{\div\, x+1} \underbrace{2x^2+7x+3}_{} \xrightarrow{\text{ریشه}} x^2+7x+6=0$

$(x+1)(x+6)=0 \Rightarrow \frac{-1}{2} \,,\; \frac{-6}{2}=-3 \Longrightarrow D_f=\mathbb{R}-\{-\frac{1}{2}, -3, -1\}$

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الف) $x^3-2x^2+2x-1 \xrightarrow{\div\, x-1} \underbrace{x^2-x+1}_{} \xrightarrow{\text{ریشه}} \Delta=1-4=-3$ ریشه ندارد $\Longrightarrow D_f=\mathbb{R}-\{1\}$

ب) $\dfrac{x+3}{(x-1)(x^2-x+1)} \geq 0 \longrightarrow$

$-\infty$		-3		1		$+\infty$
	$+$	0	$-$	$\nexists$	$+$	

$\Longrightarrow D_f=(-\infty,-3]\cup(1,+\infty)$

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$x^2-5|x-1|-2x+5 \neq 0 \Rightarrow x^2-2x+5 \neq 5|x-1| \Longrightarrow D_f=\mathbb{R}-\{2,5,0,-3\}$

$5(x-1) \neq x^2-2x+5 \longrightarrow x^2-7x+10 \neq 0 \longrightarrow x \neq 2,5$

$(x-2)(x-5)\neq 0$

$5(x-1) \neq -x^2+2x-5 \longrightarrow x^2+3x \neq 0 \longrightarrow x \neq 0,-3$

$x(x+3)\neq 0$

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الف) $|2x+1|-|x+3| \neq 0$

$\longrightarrow 2x+1 \neq x+3 \longrightarrow x \neq 2$

$\longrightarrow 2x+1 \neq -x-3 \longrightarrow x \neq -\frac{4}{3}$

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

ب) $|2x+1|-|x+3| \geq 0$

$|2x+1| \geq |x+3| \xrightarrow{\text{توان } 2} 4x^2+1+4x \geq x^2+6x+9$

$3x^2-2x-8 \geq 0 \longrightarrow$

$-\infty$		$-\frac{4}{3}$		2		$+\infty$
	$+$	0	$-$	0	$+$	

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

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الف) $1-\log_3 x > 0 \longrightarrow \log_3 x < 1 \longrightarrow x<3 \xrightarrow{\cap} \Longrightarrow D_f=(0,3)$

و

$x>0$

ب) $1-\log_{\frac{1}{2}} x > 0 \longrightarrow \log_{\frac{1}{2}} x < 1 \longrightarrow x>\frac{1}{2} \xrightarrow{\cap} \Longrightarrow D_f=(\frac{1}{2},+\infty)$

و

$x>0$

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$(I) \to 2x-1>0 \to x>\frac{1}{2}$

$(II) \to \log_5^{2x-1}>0 \to 2x-1>1$
$x>1$

$\log_{0/5}^{\log_5^{2x-1}} \geq 0 \to 2x-1 \leq 5 \to x \leq 3 \; (III)$

$\xrightarrow[(I),(II),(III)]{\cap} D_f=(1,3]$

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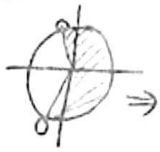
$2\cos x+1>0$

$2(\cos x)-1 \to \cos x>-\frac{1}{2} \to$



$\Rightarrow D_f=\left(2k\pi-\frac{2\pi}{3}, 2k\pi+\frac{2\pi}{3}\right)$

ب) $\frac{x-1}{x+1}>0 \to \begin{array}{c|c|c|c} -\infty & -1 & 1 & +\infty \\ \hline + & \emptyset \; - & \emptyset & + \end{array} \xrightarrow{\text{اشتراک}} (-\infty,-1)=D_f$

$\log_{10}\frac{x-1}{x+1} \geq 0 \to \frac{x-1}{x+1} \geq 1 \to \frac{x-1}{x+1}-1 \geq 0 \to \frac{-2}{x+1} \geq 0 \to \begin{array}{c} -1 \\ \hline - \; \emptyset \; + \end{array}$

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$f(x)=\sqrt{(a+2)x^2+ax+b} \to D=(-\infty,3]$

$a=-2 \to \sqrt{-2x+b} \quad -2x+b \geq 0 \to -2x \geq -b \to x \leq \frac{b}{2} \Rightarrow$

$(-\infty,3]$ = طبق فرض $\to \frac{b}{2}=3 \to \boxed{b=6}$

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اگر ریشه مضاعف داشته باشد $\to \Delta=0 \to \begin{array}{ccc} -\infty & \text{ریشه}^* & +\infty \\ \hline + & \emptyset & + \end{array} \Rightarrow 4-4(2-m^2)=0$

$m^2=1 , m=\pm 1 \Rightarrow$

$\boxed{1-(-1)=2}$

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$4-x^2 \geq 0 \to (2-x)(2+x) \geq 0 \to \begin{array}{cccc} -\infty & -2 & 2 & +\infty \\ \hline - & \emptyset \; + & \emptyset & - \end{array}$

$\xrightarrow{\cap \text{ صحیح}}$ عدد صحیح $= -2, -1, 0, 1, 2$

$\Downarrow$

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$[x]+[-x]+1 \neq 0 \to x \in \mathbb{Z}$

$\begin{cases} x \in \mathbb{Z} \to \underbrace{[x]+[-x]}_{\text{صفر}}+1=1 \\ x \notin \mathbb{Z} \to \underbrace{[x]+[-x]}_{-1}+1=0 \end{cases}$