نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ..... کلاس .....

۱

الف) $y = x^3 - 3x^2 + 3x - 1 + 1 \rightarrow y - 1 = (x-1)^3$

$\rightarrow x - 1 = \sqrt[3]{y-1} \rightarrow x = \sqrt[3]{y-1} + 1$

$R_f = \mathbb{R}$

ب) $y = \frac{1}{x^2 - 2x} \rightarrow yx^2 - 2xy = 1 \rightarrow yx^2 - 2yx - 1 = 0$

$\Delta = 4y^2 + 4y \geq 0$

$4y(y+1) \geq 0 \quad \begin{matrix} \rightarrow y = 0 \\ \rightarrow y = -1 \end{matrix}$

	-1		0	
	+	0	-	0	+

$R_f = \mathbb{R} - (-1, 0)$

۲

الف) $y = x^2 - 4x + 10$

$y_{min} \rightarrow -\frac{16 - 40}{4} = 6 \rightarrow R_f = [6, +\infty)$

ب) $y = -x^2 + 6x + 4$

$y_{max} \rightarrow -\frac{36 + 12}{-4} = \frac{48}{4} = 12 \rightarrow R_f = (-\infty, 12]$

ج) $y = \sqrt{x^2 - 4x - 4}$

$-\frac{16 + 12}{4} = -7 \rightarrow y_{min} \rightarrow [-7, +\infty) \rightarrow R_f = [0, +\infty)$

د) $y = \sqrt{6x - x^2}$

$-\frac{36}{-4} = 9 \rightarrow y_{max} \rightarrow (-\infty, 9] \rightarrow R_f = [0, 3]$

۳

الف) $y = x^4 - 2x^2 + 4x + 1 \rightarrow R_f = \mathbb{R}$

ب) $y = x^6 - 6x^4 + 12x + 12 \rightarrow R_f = \mathbb{R}$

ج) $y = \sqrt{x^4 - 6x^2 + 2x + 1}$ زیر رادیکال $\rightarrow \mathbb{R} \rightarrow R_f = [0, +\infty)$

د) $y = (x^3 - 4x^2 + 3x + 1)^2 \rightarrow (-\infty, +\infty) \rightarrow \mathbb{R} \rightarrow R_f = [0, +\infty)$

۴

الف) $y = \frac{3x + 1}{x - 2} \rightarrow R_f = \mathbb{R} - \{3\}$

ب) $y = \frac{2x + 1}{x + 1} \rightarrow R_f = \mathbb{R} - \{2\}$

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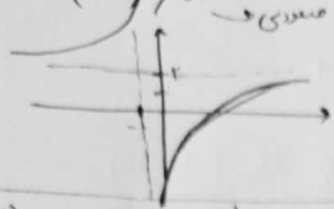
الف) $y = \sqrt{\frac{2x + 4}{x + 1}} \rightarrow \mathbb{R} - \{-1\} \rightarrow R_f = [0, +\infty) - \{\sqrt{2}\}$

ب) $y = \sqrt{\frac{2x + 1}{-x + 2}} \rightarrow \mathbb{R} - \{2\} \rightarrow R_f = [0, +\infty)$

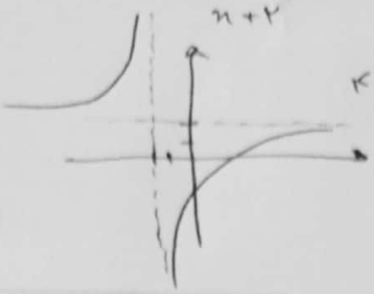
الف) $y=\frac{2x-3}{x+1}$ → قائم: -1 ، افقی: 2

$2-(-3)>0$ → صعودی



ب) $y=\frac{2x-1}{x+2}$ قائم: -2 ، افقی: 2

$4-(-1)>0$ صعودی ۶



الف) $y=\sin x+\frac{1}{\sin x}$ $\xrightarrow{-1\le \sin x\le 1}$ $R_f=(-\infty,-2]\cup[2,+\infty)$

ب) $y=\frac{x^4+1}{x^2}$ → $x^2+\frac{1}{x^2}$ → $R_f=(-\infty,-2]\cup[2,+\infty)$

ج) $y=\frac{\sqrt[3]{x^2}+1}{\sqrt[3]{x}}$ → $\sqrt[3]{x}+\frac{1}{\sqrt[3]{x}}$ → $R_f=(-\infty,-2]\cup[2,+\infty)$ ۷

د) $y=\sqrt{x}+\frac{1}{\sqrt{x}}$ $\xrightarrow{\sqrt{x}\ge 0}$ $R_f=[2,+\infty)$

الف) $y=x^2+\frac{1}{x^2+3}$ $\xrightarrow{+3-3}$ $\left(x^2+3+\frac{1}{x^2+3}\right)-3$ → $R_f=[\frac{1}{3},+\infty)$

→ $x=0$ → $3+\frac{1}{3}$ → $\frac{10}{3}$ → -3 → $\frac{1}{3}$ ۸

ب) $y=\frac{x^2+5}{\sqrt{x^2+4}}$ → $\sqrt{x^2+4}+\frac{1}{\sqrt{x^2+4}}$ → $R_f=[\frac{5}{2},+\infty)$

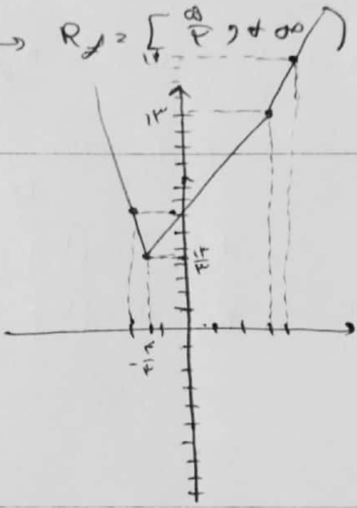
$\xrightarrow{x=0}$ $2+\frac{1}{2}$ → $\frac{5}{2}$

$y=|x-3|+|3x+4|$

$x=3$ ، $x=-\frac{4}{3}$

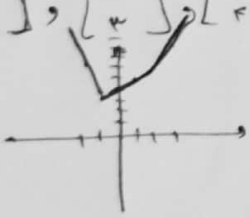
$-\frac{4}{3}$		3
$-x+3-3x-4$	$-x+3+3x+4$	$x-3+3x+4$
$-4x-1$	$2x+7$	$4x+1$

$\frac{13}{3}$ ، 13 ۹



الف) $y=|x-2|+|2x+2|$

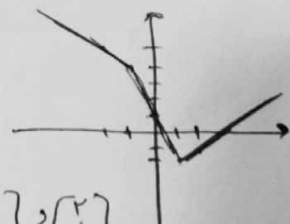
$\begin{bmatrix}-2\\6\end{bmatrix},\begin{bmatrix}-1\\3\end{bmatrix},\begin{bmatrix}0\\4\end{bmatrix},\begin{bmatrix}1\\5\end{bmatrix},\begin{bmatrix}2\\6\end{bmatrix},\begin{bmatrix}3\\9\end{bmatrix}$



$R_f=[3,+\infty)$

ب) $y=|2x-2|-|x+1|$

$R_f=[-2,+\infty)$ ۱۰



$\begin{bmatrix}-2\\5\end{bmatrix},\begin{bmatrix}-1\\4\end{bmatrix},\begin{bmatrix}0\\1\end{bmatrix},\begin{bmatrix}1\\-2\end{bmatrix},\begin{bmatrix}2\\-1\end{bmatrix}$