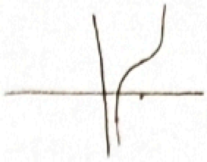
نام و نام خانوادگی: کیمیا رحیمی   شماره پاسخنامه: ۶   گروه: یازدهم دختر A   ۱۸

1
الف) $y = x^3 - 3x^2 + 3x - 1 + 1 \Rightarrow y = (x-1)^3 + 1$ $R_f = \mathbb{R}$



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ب) $y = \frac{1}{x^2 - 2x} \Rightarrow yx^2 - 2yx - 1 = 0 \Rightarrow \Delta \Rightarrow 4y^2 - 4(y)(-1) = 4y^2 + 4y$

$\Rightarrow \frac{2 \pm \sqrt{4y^2 + 4y}}{2y} \Rightarrow 4y^2 + 4y \geq 0 \Rightarrow 4y(y+1) \geq 0$

$y \neq 0$

$R_f = (-\infty, -1] \cup (0, +\infty)$

2
الف) $x^2 - 4x + 10$ $\Delta \Rightarrow 16 - 4(1)(10) = -24 \Rightarrow \frac{-\Delta}{4a} = \frac{24}{4} = \boxed{6}$

$R_f = [6, +\infty)$

ب) $-x^2 + 6x + 3$ $\Delta = 36 - 4(-1)(3) = 36 + 12 = 48$ $\frac{-\Delta}{4a} \Rightarrow \frac{-48}{-4} = \boxed{12}$

$R_f = (-\infty, 12]$

ج) $\sqrt{x^2 - 4x - 3}$ $\Delta = 16 - 4(1)(-3) = 16 + 12 = 28 \Rightarrow \frac{-28}{4} = -7 \Rightarrow R_f = [0, +\infty)$

د) $\sqrt{6x - x^2}$ $\frac{-36}{-4} = 9$ $R_f = (-\infty, 3]$ $[0, 3]$

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3
الف) $y = x^3 - 5x^2 + 3x + 1$ $R_f = \mathbb{R}$

ب) $y = x^7 - 6x^4 + 3x - 2$ $R_f = \mathbb{R}$

ج) $y = \sqrt{x^7 - 6x^3 + 5x + 1}$ $R_f = [0, +\infty)$

د) $y = (x^5 - 4x^2 + 3x + 1)^2$ $R_f = [0, +\infty)$

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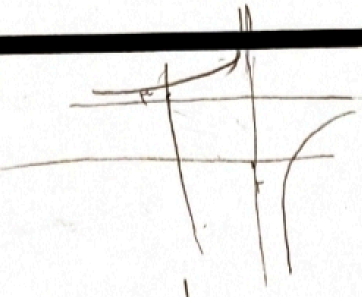
4
الف) $\frac{3x + 1}{x - 2}$



$R_f = \mathbb{R} - \{3\}$

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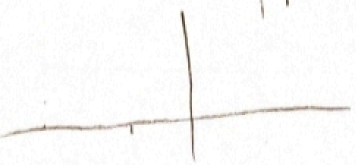
ب) $\frac{2x + 1}{x + 1}$



$R_f = \mathbb{R} - \{2\}$

5
$\left(y = \sqrt{\frac{2x + 4}{x + 1}}\right)^2 \Rightarrow y^2 x + y^2 = 2x + 4 \Rightarrow y^2 x - 2x = -y^2 + 4 \Rightarrow x(y^2 - 2) = -y^2 + 4$

$\frac{-y^2 + 4}{y^2 - 2}$

$R = [0, +\infty) - \{\sqrt{2}\}$

$R_f = (-\infty, -\sqrt{2}) \cup (\sqrt{2}, \ldots)$

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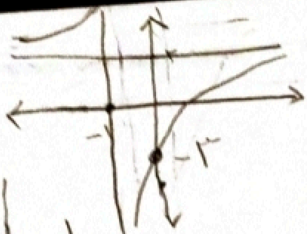
$\left(y = \sqrt{\frac{3x + 1}{2 - x}}\right)^2 \Rightarrow 2y^2 - y^2 x = 3x + 1$ $R = [0, +\infty)$

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

الف) $y=\frac{2x-3}{x+1}$ 6



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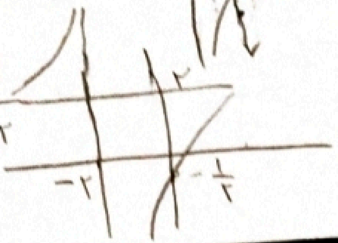
ب) $\frac{2x-1}{x+2}$



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

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$y=\frac{x^4+1}{x^2}=x^2+\frac{1}{x^2}$ $R_f=(-\infty,-2]\cup[2,+\infty)$ 7

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

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

$y=x^2+\frac{1}{x^2+3}=x^2+\frac{1}{x^2+3}+3-3$ $R_f=[\frac{1}{3},+\infty)$

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$\min=\sqrt{4}+\frac{1}{\sqrt{4}}$ $\frac{4+1}{\sqrt{4}}=\frac{5}{\sqrt{4}}=$ 8

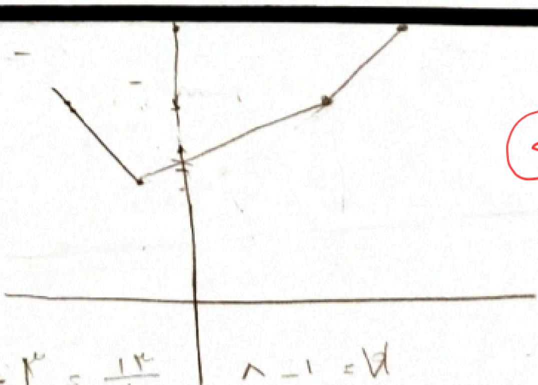
$\frac{x^2+5}{\sqrt{x^2+4}}=\frac{x^2+4+1}{\sqrt{x^2+4}}=\sqrt{x^2+4}+\frac{1}{\sqrt{x^2+4}}$ $R_f=[\frac{5\sqrt{4}}{4},+\infty)$

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

$-x+3$

$-\frac{4}{3}$ 3

$-4x-1$ | $2x+7$ | $4x+1$



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9

$-\frac{4}{3}\times2+7$

$-\frac{8}{3}+7=-\frac{8}{3}+\frac{21}{3}=\frac{13}{3}$

$-4\times-\frac{4}{3}-1=\frac{16}{3}-\frac{3}{3}=\frac{13}{3}$

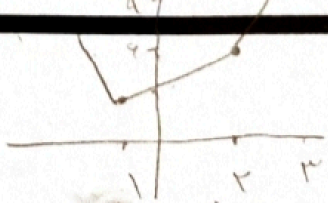
$8-1=7$

$y=|x-2|+|2x+2|$

$-x+2$ $x+$

-1 2

$-3x$ | $x+4$ | $3x$



$R_f=[3,+\infty)$

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10

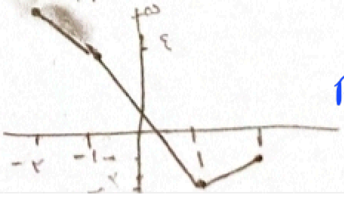
$y=|2x-2|-|x+1|$

-1 1

$-x+3$ | $-3x+1$ | $x-3$

$2x-2-x-1=x-3$

$-2x+2-x-1$, $-2x+2+x+1=-x+3$



$R=[-2,+\infty)$

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$$\sqrt{x^2+4}+\frac{1}{\sqrt{x^2+4}} \xrightarrow{x^2=0} \frac{5}{2} \qquad R=\left[\frac{5}{2}, +\infty\right)$$