نام و نام خانوادگی: نسیا انصاری | تکلیف شماره ۹ | کلاس پنجم A

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$y = x^2 - 5 \Rightarrow x^2 = y + 5 \Rightarrow x = \sqrt{y+5} \Rightarrow y + 5 \geq 0 \Rightarrow y \geq -5 \Rightarrow R_f = [-5, +\infty)$

ب) $y = x^3 + 1 \Rightarrow x^3 = y - 1 \Rightarrow x = \sqrt[3]{y-1} \Rightarrow R_f = \mathbb{R}$

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الف) $y = x^2 - 4x + 6 \Rightarrow y = (x-2)^2 + 2 \Rightarrow (x-2)^2 = y - 2 \Rightarrow x - 2 = \sqrt{y-2} \Rightarrow x = \sqrt{y-2} + 2$

$y - 2 \geq 0 \Rightarrow y \geq 2 \Rightarrow R_f = [2, +\infty)$

ب) $y = x^2 - 3x + 1 \Rightarrow y = x^2 - 3x + 1 + 3/25 - 3/25 \Rightarrow y = (x - 3/2)^2 - 3/25 \Rightarrow (x - 3/2)^2 = y + 3/25$

$\Rightarrow x - 3/2 = \sqrt{y + 3/25} \Rightarrow x = \sqrt{y + 3/25} + 3/2 \Rightarrow y + 3/25 \geq 0 \Rightarrow y \geq -3/25 \Rightarrow R_f = [-3/25, +\infty)$

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الف) $y = \frac{x^2 + 3}{x^2 - 2} \rightarrow yx^2 - 2y = x^2 + 3 \Rightarrow yx^2 - x^2 = 3 + 2y \Rightarrow x^2(y-1) = 3 + 2y \Rightarrow x^2 = \frac{3 + 2y}{y - 1} \Rightarrow x = \sqrt{\frac{3+2y}{y-1}}$

	$-\frac{3}{2}$		1	
+	ϕ	−	∄	+

$\Rightarrow R_f = (-\infty, -\frac{3}{2}] \cup (1, +\infty)$

ب) $y = \frac{2|x| + 1}{|x| - 3} \rightarrow y|x| - 3y = 2|x| + 1 \Rightarrow y|x| - 2|x| = 1 + 3y \Rightarrow |x|(y-2) = 1 + 3y \Rightarrow |x| = \frac{1+3y}{y-2}$

	$-\frac{1}{3}$		2	
+	ϕ	−	∄	+

$\Rightarrow R_f = (-\infty, -\frac{1}{3}] \cup (2, +\infty)$

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$y = \frac{1}{x^2 - 6x} \rightarrow \frac{1}{x^2 - 6x + 9 - 9} = \frac{1}{(x-3)^2 - 9} \rightarrow y(x-3)^2 - 9y = 1 \rightarrow y((x-3)^2 - 9) = 1 \rightarrow (x-3)^2 - 9 = \frac{1}{y}$

$\rightarrow (x-3)^2 = \frac{1}{y} + 9 \Rightarrow x - 3 = \sqrt{\frac{1}{y} + 9} \rightarrow x = \sqrt{\frac{1}{y} + 9} + 3$

$\frac{1}{y} + 9 \geq 0 \Rightarrow \frac{1}{y} \geq -9 \Rightarrow 1 \geq -9y \Rightarrow y \leq -\frac{1}{9}$ یا $y > 0$

$\Rightarrow R_f = (-\infty, -\frac{1}{9}] \cup (0, +\infty)$

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$y = x^2 - 4x + 7 \begin{cases} x_{min} = \frac{-b}{2a} = \frac{4}{2} = 2 \\ y_{min} = 4 - 8 + 7 = 3 \end{cases} \rightarrow R_f = [3, +\infty)$

ب) $y = -x^2 + 4x + 2 \begin{cases} x_{max} \rightarrow \frac{-b}{2a} = \frac{-4}{-2} = 2 \\ y_{max} \rightarrow -4 + 8 + 2 = 6 \end{cases} \rightarrow R_f = (-\infty, 6]$

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الف) $y=\sqrt{x^2-4x+2}$ $\begin{cases} x_{min} \to \frac{-b}{2a}=\frac{4}{2}=2 \\ y_{min} \to 4-8+2=-2 \end{cases} \to R_f=\sqrt{[-2,+\infty)} \to R_f=[0,+\infty)$

ب) $y=\sqrt{-x^2+4x+10}$ $\begin{cases} x_{max} \to \frac{-b}{2a} \to \frac{-4}{-2}=2 \\ y_{max} \to -4+8+10=14 \end{cases} \to R_f=\sqrt{(-\infty,14]} \to R_f=[0,\sqrt{14}]$

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الف) $y=x^{\frac{7}{2}}+2x^{\frac{5}{2}}+2x+1 \to R_f=\mathbb{R}$

ب) $y=\sqrt{x^6+2x^4+4x+1} \to R_f=\sqrt{\mathbb{R}} \Rightarrow R_f=[0,+\infty)$

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الف) $y=\frac{3x+1}{x-2} \Rightarrow R_f=R-\{\frac{a}{c}\} \to R_f=\mathbb{R}-\{3\}$

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

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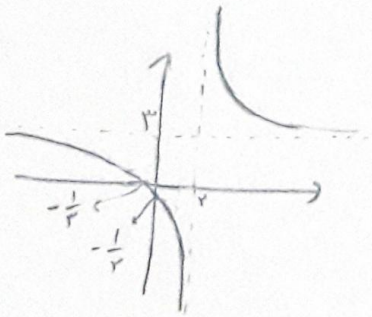
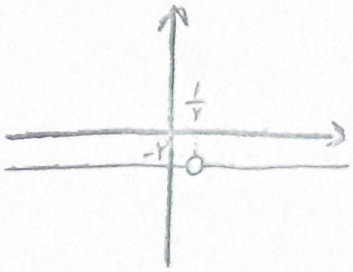
الف) $y=\frac{3x+1}{x-2}$ $\frac{a}{c}=3$

$x-2=0 \Rightarrow x=2$



ب) $y=\frac{4x-2}{1-2x}=\frac{2(2x-1)}{-1(2x-1)}=-2$



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الف) $y=\cos^2 x+\frac{1}{\cos^2 x} \to a+\frac{1}{a} \to R_f=[2,+\infty)$ $a>0$

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