

$$1) y = x^2 - 5 \Rightarrow x^2 = y + 5 \Rightarrow x = \pm \sqrt{y + 5} \Rightarrow R_f = [-5, +\infty)$$

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$$2) y = x^2 + 1 \Rightarrow x^2 = y - 1 \Rightarrow x = \pm \sqrt{y - 1} \Rightarrow R_f = R$$

$$1) y = x^2 - 4x + 4 \Rightarrow y = (x - 2)^2 + 2 \Rightarrow (x - 2)^2 = y - 2 \Rightarrow x - 2 = \pm \sqrt{y - 2} \Rightarrow$$

$$x = \pm \sqrt{y - 2} + 2 \Rightarrow R_f = [2, +\infty)$$

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$$2) x = \frac{-b}{2a} = \frac{5}{2} \quad y = \left(\frac{5}{2}\right)^2 - 4\left(\frac{5}{2}\right) + 4 = \frac{25}{4} - \frac{20}{2} + 4 = -\frac{11}{4}$$

$$\Rightarrow \left[-\frac{11}{4}, +\infty\right)$$

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$$1) y = \frac{x^2 + 2}{x^2 - 2} \Rightarrow x^2 + 2 = yx^2 - 2y \Rightarrow x^2 - yx^2 = -2 - 2y \Rightarrow x^2 = \frac{-2 - 2y}{1 - y} \Rightarrow$$

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

$$2) y = \frac{2|x| + 1}{|x| - 2} \Rightarrow 2|x| + 1 = |x|y - 2y \Rightarrow 2|x| - y|x| = -1 - 2y \Rightarrow |x| = \frac{-1 - 2y}{2 - y} \Rightarrow$$

$$|x| = \frac{2y + 1}{2 - y} \Rightarrow \frac{-\frac{1}{2-y}}{+\frac{2}{2-y}} \Rightarrow (-\infty, -\frac{1}{2-y}] \cup (2, +\infty)$$

$$y = \frac{1}{x^2 - 4x} \Rightarrow 1 = yx^2 - 4xy \Rightarrow 1 = x(yx - 4y) \Rightarrow x = \frac{1}{yx - 4y} \Rightarrow$$

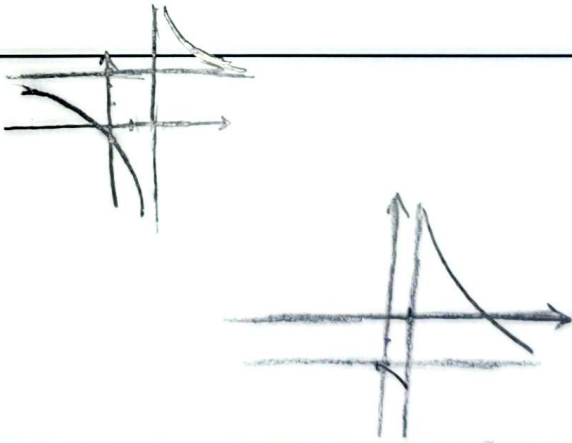
$$x = \frac{1}{y(x - 4)} \Rightarrow y(x - 4) \neq 0 \Rightarrow R - \{0, 4\}$$

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$$1) y = x^2 - 4x + 2 \Rightarrow \min \left\{ \frac{-b}{2a} = \frac{4}{2} = 2 \right. \Rightarrow [-2, +\infty)$$

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$$2) y = -x^2 + 4x + 2 \Rightarrow \max \left\{ \frac{-b}{2a} = \frac{-4}{-2} = 2 \right. \Rightarrow (-\infty, 4]$$

$1) y = \sqrt{x^2 - 4x + 7} \Rightarrow \min \begin{cases} \frac{-b}{2a} = \frac{4}{2} = 2 \\ -\infty \end{cases} \Rightarrow \sqrt{[-\infty, +\infty)} \Rightarrow [0, +\infty)$	
$2) y = \sqrt{-x^2 + 6x + 10} \Rightarrow \max \begin{cases} \frac{-b}{2a} = \frac{-6}{-2} = 3 \\ 10 \end{cases} \Rightarrow \sqrt{(-\infty, 10]} \Rightarrow [0, \sqrt{10}]$	6
$1) y = x^3 + 3x^2 + 3x + 1 \Rightarrow R_f = \mathbb{R}$	
$2) y = \sqrt{x^4 + 6x^2 + 9} \Rightarrow \sqrt{\mathbb{R}} \Rightarrow [0, +\infty)$	7
$1) y = \frac{3x+1}{x-2} \Rightarrow R_f = \mathbb{R} - \{3\}$	
$2) y = \sqrt{\frac{3x+1}{x+2}} \Rightarrow R_f = \mathbb{R} - \{3\}$	8
$1) y = \frac{3x+1}{x-2} \Rightarrow \begin{matrix} x-2 = 2 & \text{فقط} \\ 3 & \text{فقط} \end{matrix}$	
$2) y = \frac{3x-2}{1-2x} \Rightarrow \begin{matrix} 1-2x = \frac{1}{2} & \text{فقط} \\ -2 & \text{فقط} \end{matrix}$	
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$1) y = \cos^2 x + \frac{1}{\cos^2 x} \Rightarrow R_f = [2, +\infty)$	
$2) y = \sqrt[3]{\frac{x^2+1}{x}} \Rightarrow \sqrt[3]{x + \frac{1}{x}} \Rightarrow (-\infty, -2] \cup [2, +\infty)$	10