

۱۹، ۲۵ آزمون ۳

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

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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) $y = x^2 - 4x + 7 \rightarrow x^2 - 4x + 7 - y = 0 \quad x = \frac{-b \pm \sqrt{\Delta}}{2a}$
 $\Delta \geq 0 \quad 16 - 4(7-y) \geq 0 \rightarrow 16 - 28 + 4y \geq 0 \rightarrow 4y \geq 12 \rightarrow y \geq 3 \quad R_f = [3, +\infty)$

ب) $y = x^2 - 4x + 1 \rightarrow x^2 - 4x + 1 - y = 0 \quad x = \frac{-b \pm \sqrt{\Delta}}{2a}$
 $16 - 4(1-y) \geq 0 \rightarrow 16 - 4 + 4y \geq 0 \rightarrow 12 + 4y \geq 0 \rightarrow y \geq -3 \quad R_f = [-3, +\infty)$

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

$\frac{3y+3}{y-1} \geq 0$
 $y = \frac{3|x|+1}{|x|-1}$
 $\frac{3y+1}{y-1} \geq 0$

ب) $y|x| - 4y = 2|x| + 1 \quad |x|(y-2) = 4y+1 \rightarrow |x| = \frac{4y+1}{y-2}$
 $R_f = (-\infty, -\frac{1}{4}] \cup (2, +\infty)$

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الف) $y = \frac{1}{x^2 - 4x} \quad yx^2 - 4yx - 1 = 0 \quad x = \frac{-b \pm \sqrt{\Delta}}{2a}$

ب) $x = \frac{4y \pm \sqrt{16y^2 + 4y}}{2y}$
 $\Delta \geq 0 \quad 16y^2 + 4y \geq 0 \quad y(4y+1) \geq 0$
 $R_f = (-\infty, -\frac{1}{4}] \cup (0, +\infty)$

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الف) $y = x^2 - 4x + 2 \quad \min \left| \frac{y}{x} = 3 \right| \quad 9 - 4x + 2 = -3 \quad R_f = [-3, +\infty)$

ب) $y = -x^2 + 4x + 2 \quad \max \left| \frac{-y}{x} = 2 \right| \quad -4 + 4x + 2 = 2 \quad R_f = (-\infty, 2]$

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$$y = \sqrt{x^2 - 2x} \quad \min \left| \frac{y}{x} = \frac{2}{-1} \rightarrow R_F = \sqrt{[-1, +\infty)} = [-1, +\infty) \quad (\text{الف})$$

$$y = \sqrt{-x^2 + 4x + 10} \quad \max \left| \frac{-x}{-1} = 1 \right. \\ \left. \begin{array}{l} 1 \text{ ع} \\ 1 \text{ ع} \end{array} \right.$$

$$R_F = \sqrt{(-\infty, 1 \text{ ع}]} = [0, \sqrt{1 \text{ ع}}]$$

$$y = x^2 + 2x \text{ ع} + 2x + 1 \quad \text{بیشترین و کمترین مقدار}$$

$$R_F = \mathbb{R}$$

$$y = \sqrt{x^2 + 4x^2 + 4x + 1}$$

$$R_F = \sqrt{\mathbb{R}} = [0, +\infty)$$

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

تangent

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

$$y = \sqrt{\frac{x^2 + 1}{x + 2}}$$

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

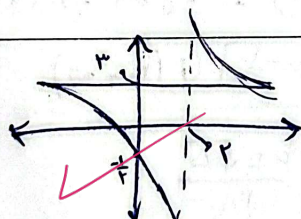
$$y = \frac{x^2 + 1}{x - 2}$$

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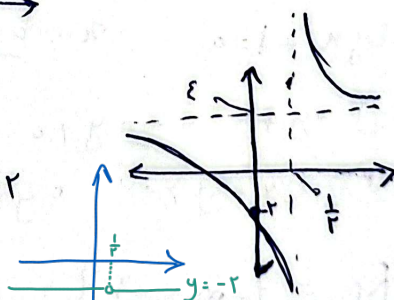
$$y = \frac{x^2 - 2}{1 - 2x}$$

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

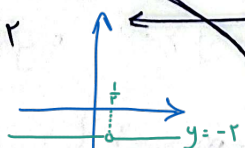
تangent -2 است
با شیب صاف



$$x = 2 \text{ ع} \quad y = \frac{1}{x}$$



$$x = 0 \rightarrow y = -2$$



$$y = \cos^2 x + \frac{1}{\cos^2 x}$$

$\Rightarrow$

$$R_F = [1, +\infty)$$

$$y = \sqrt{\frac{x^2 + 1}{x}}$$

$$= \sqrt{x + \frac{1}{x}}$$

$$= \sqrt{(-\infty, -1] \cup [1, +\infty)} \Rightarrow$$

$$R_F = (-\infty, \sqrt{-1}] \cup [\sqrt{1}, +\infty)$$