

1A, 2A

سری 4

سری A از فصل

عبارت درونی

$$y = x^2 - 2x^2 + 2x$$

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

$$y = (x-1)^2 + 1$$

$$x = \sqrt{y-1} + 1$$

$$R_f = \mathbb{R} \checkmark$$

$$y = x^2 - 2x + 10 \rightarrow (x-1)^2 + 9 \rightarrow \min | 9$$

$$R_f = [9, +\infty) \checkmark$$

$$y = \sqrt{x^2 - 2x - 3}$$

$$\frac{-\Delta}{2a} = \frac{-12 - 14}{2} = -13$$

$$R_f = \sqrt{[-13, +\infty)} = [0, +\infty) \checkmark$$

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

$$R_f = \mathbb{R} \checkmark$$

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

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

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

$$R_f = \mathbb{R} - \left\{\frac{a}{a}\right\} = \mathbb{R} - \{1\} \checkmark$$

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

$$R_f = \sqrt{\mathbb{R} - \{1\}} = [0, \sqrt{2}) \cup (\sqrt{2}, +\infty)$$

به ازای x=1
مخرج صفر می شود

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

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

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

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

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

$$y = \frac{-2x + 4x + 1}{x^2} \Rightarrow \frac{-\Delta}{2a} = \frac{4ac - b^2}{4a} = \frac{-12 - 14}{-4} = 5$$

$$R_f = (-\infty, 5] \checkmark$$

$$y = \sqrt{4x - x^2}$$

$$R_f = \sqrt{[0, 4]}$$

$$\frac{-\Delta}{2a} = \frac{-16}{-2} = 8$$

$$R_f = [0, 2] \checkmark$$

$$y = x^2 - 4x^2 + 2x + 2$$

$$R_f = \mathbb{R} \checkmark$$

$$y = (x^2 + 2x + 1)^2$$

$$R_f = (\mathbb{R})^2 = [0, +\infty) \checkmark$$

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

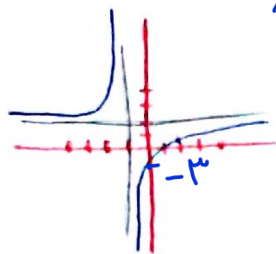
$$R_f = \mathbb{R} - \{1\} \checkmark$$

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

$$R_f = \sqrt{\mathbb{R} - \{1\}} = [0, +\infty) \checkmark$$

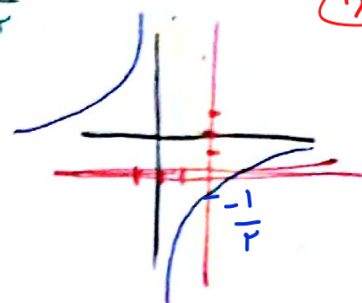
(1, \infty)

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



حل بر خود با محور ها خیره

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



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

$-1 < \sin x < 1$

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

$-\infty < x^2 < +\infty \rightarrow R_f = \mathbb{R} - (-2, 2) \checkmark$

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

$-\infty < \sqrt{x} < +\infty \rightarrow R_f = \mathbb{R} - (-2, 2) \checkmark$

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

$\sqrt{x} \geq 0 \rightarrow R_f = [2, +\infty) \checkmark$

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

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

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

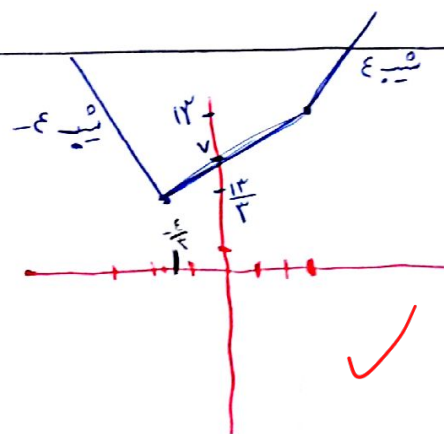
$\sqrt{x^2+\epsilon} > 0 \rightarrow R_f = [2, +\infty)$

$\sqrt{x^2+\epsilon} > 0 \rightarrow$ این عبارت مثبت است $\rightarrow 2 + \frac{1}{2} = \frac{5}{2}$
 ندارد و کمترین مقدارش ۲ است

$R_f = [2, +\infty) - 2 \rightarrow R_f = [\frac{5}{2}, +\infty)$

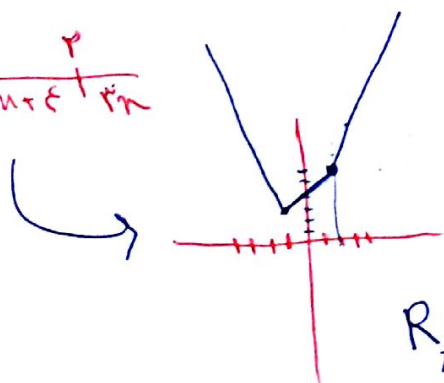
$$y = |x-2| + |x+2|$$

$$\frac{-2}{-x-1} \quad \frac{2}{x+1} \quad \frac{2}{x+1}$$



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

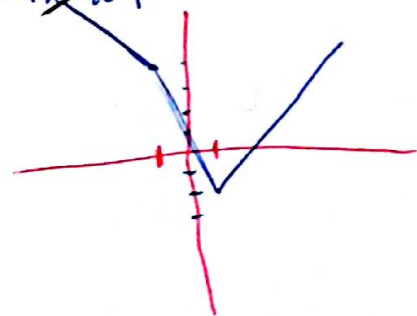
$$\frac{-1}{-x-1} \quad \frac{1}{x+1} \quad \frac{1}{x+1}$$



$$R_f = [2, +\infty) \checkmark$$

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

$$\frac{-1}{x-1} \quad \frac{1}{1-x} \quad \frac{1}{1-x}$$



$$R_f = [-2, +\infty) \checkmark$$