

۱) افریکی و حید (۱) دوار دهم - (۲۵)

$$\begin{aligned} f(-x) - x f(x) &= 2|x| + 1 \times x \\ f(x) + x f(-x) &= 2|-x| + 1 \times -1 \\ \hline x f(-x) - x^2 f(x) &= 2x|x| + x \\ -f(x) - x f(-x) &= -2|-x| - 1 \\ \hline -x^2 f(x) - f(x) &= 2x|x| - 2|-x| + x - 1 \\ f(x)(-x^2 - 1) &= |x|(2x - 2) + x - 1 \end{aligned}$$

$$1 - x = |x|$$

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

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$$f(0) = 1$$

$$f(0) = 3$$

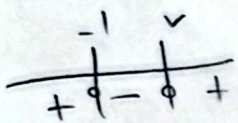
$$f(x) = x^2 - 2x + 3$$

$$f(x^2) = x^4 - 2x^2 + 3$$

۲- اگر $x = 0$

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

$$x^2 + x - 2x + 2 + x \rightarrow x^2 + x(1 - 2) + 2 + x \rightarrow \Delta \geq 0 \rightarrow (1 - 2)^2 - 4(2 + x) \geq 0$$



$$x^2 - x - 2 \geq 0 \rightarrow (x - 2)(x + 1) \geq 0$$

$$1 + x^2 - 2x - 1 - 2x \geq 0$$

$$R_f = (-\infty, -1] \cup [2, +\infty)$$

$$\frac{-b}{2a} = \frac{-(-2)}{2(1)} = 1$$

$$R_f = \sqrt{(-2)^2 - 4(1)(-1)} = \sqrt{8} = 2\sqrt{2}$$

$$R_f = (-\infty, +\infty)$$

$$R_f = [0, +\infty)$$

۳- $x^2 - 3$

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

$$R_f = \mathbb{R} - \left\{ \frac{3}{2} \right\}$$

۴- الف) $R_f = \mathbb{R}$

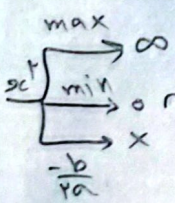
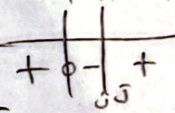
$$(x^2 + 3) + \frac{1}{x^2 + 3} - 3 \rightarrow 3 + \frac{1}{x^2 + 3} - 3 = \frac{1}{x^2 + 3}$$

$$\sqrt{x^2 + 3} + \frac{1}{\sqrt{x^2 + 3}} \Rightarrow \sqrt{x^2 + 3} + \frac{1}{\sqrt{x^2 + 3}} = \frac{x^2 + 4}{\sqrt{x^2 + 3}}$$

$$R_f = \left[\frac{4}{\sqrt{3}}, +\infty \right)$$

$$2x^2 - x = 3x^2 + 3 \rightarrow 3x^2 - 2x^2 = -4 - x \rightarrow x^2(3 - 2) = -4 - x \rightarrow x = \sqrt{\frac{-4 - x}{3 - 2}}$$

$$R_f = (-\infty, -2] \cup [3, +\infty)$$



$$\frac{3(0)^2 + 3}{(0)^2 - 1} = -3$$

تعداد اشیاء منفی باید
تعداد اشیاء مثبتی شود.

$$R_f = (-\infty, -2] \cup [3, +\infty)$$

۵- الف) $R_f = \mathbb{R}$

$$\sin x \rightarrow -1 \leq \sin x \leq 1 \rightarrow R_f = \left[-\frac{1}{2}, -\frac{1}{5} \right]$$

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$$\frac{2x - 9}{2x - 4} = 1 - \frac{5}{2x - 4}$$

$$\frac{2x - 11}{-1 + 2x} = \frac{2x - 9}{2x - 4}$$

$$R_f = [0, +\infty)$$

۸- الف) $R_f = \mathbb{R}$

$$\frac{2x - 9}{2x - 4} > 1 \rightarrow x < 5$$

$$0 \leq \frac{2x - 9}{2x - 4} < 1 \rightarrow x > \frac{9}{2}$$

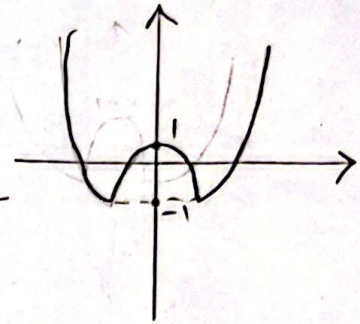
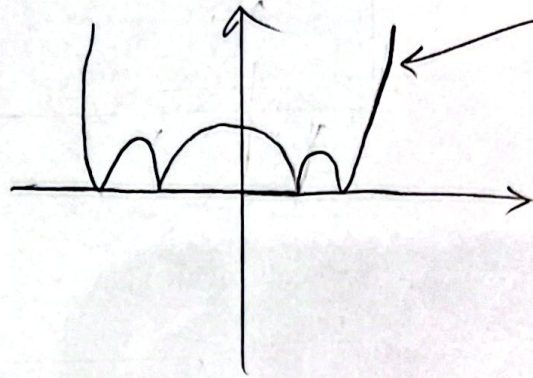
$$R_f = \left[\frac{9}{2}, 5 \right) \cup (5, +\infty)$$

$$\mathbb{R} = [-1, +\infty) \leftarrow (x-1)^2 - 1 \leftarrow f(x) = x^2 - 2x \leftarrow |x| = x \leftarrow x \geq 0 \quad -9$$

$$\textcircled{119} \leftarrow \text{اختيار } \mathbb{R} = (-\infty, 1] \leftarrow 1 - (x+1)^2$$

$$f(x) = |x^2 - 2|$$

$$f(|x|) = ||x|^2 - 2| + 1$$



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