

رسا رضوانی راد ۱۲ سپر A

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

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

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

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

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

$$2f(0) = 1 \Rightarrow f(0) = \frac{1}{2} \quad f(x) = x^2 - 2x + \frac{1}{2}$$

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

$$xy - y = x^2 + x + \frac{1}{2} \Rightarrow x^2 + (1-y)x + \frac{1}{2} - y = 0$$

$$x = \frac{y-1 \pm \sqrt{y^2 - 2y + 1 - 4y + 2}}{2} \Rightarrow y^2 - 2y - 1 \geq 0$$

$$\Rightarrow y \in [-1, 3]$$

$$\frac{-b}{2a} = \frac{\omega}{\epsilon} \quad \text{min} \Rightarrow \frac{x \times \frac{\omega}{\epsilon}}{1 \times 1} - \frac{\frac{\omega}{\epsilon}}{\epsilon} + 1 \leq 1 - \frac{\frac{\omega}{\epsilon}}{\lambda}$$

$$\Rightarrow \frac{-1\omega}{\lambda}$$

$$R = [-\frac{1\omega}{\lambda}, +\infty)$$

Subject.

Day. Month. Year.

$$-x^2 + 4x - 4 \quad \frac{-4}{-1} = 4 \quad -4 + 16 - 4 = 8$$

$$\rightarrow (-\infty, 4] \rightarrow \sqrt{(-\infty, 4]} = [0, 2]$$

$$\sqrt{1R} = [0, +\infty) \quad R_f = 1R \quad \text{تابع درجه فرد است} \quad (ج)$$

$$\log_{10} \rightarrow \text{graph} \quad R_f = 1R \quad (د)$$

$$R_f = 1R - \left\{ \frac{3}{2} \right\} \quad \text{الف-ا} \quad (د)$$

$$\sqrt{1R - \{4\}} = [0, +\infty) - \{2\} \quad (ب)$$

$$\frac{x^2 + 3 + 1}{\sqrt{x^2 + 3}} = \sqrt{x^2 + 3} + \frac{1}{\sqrt{x^2 + 3}} \Rightarrow R_f = \left[\sqrt{3} + \frac{1}{\sqrt{3}}, +\infty \right) \quad (ج)$$

$$x^2 + 4 + \frac{1}{x^2 + 4} - 4 \quad \left[\frac{1}{4}, +\infty \right) \quad (د)$$

$$x^2 = \frac{y + 4}{y - 4} \rightarrow x = \pm \sqrt{\frac{y + 4}{y - 4}} \quad \text{۴- روش اصلی:}$$

$$\Rightarrow y \in (-\infty, -4] \cup [4, +\infty)$$

$$\begin{array}{l} +\infty \rightarrow 4 \\ 0 \rightarrow -4 \end{array} \quad \begin{array}{l} \text{نقطه صفر} \\ \text{حیث شمره} \end{array} \rightarrow R_f = (-\infty, -4] \cup (4, +\infty) \quad \text{تکثر ۲:}$$

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$$\sin x = 1 \rightarrow -\frac{\pi}{2}$$

$$\sin x = -1 \rightarrow \frac{\pi}{2}$$

$$R_f = [-\frac{\pi}{2}, \frac{\pi}{2}]$$

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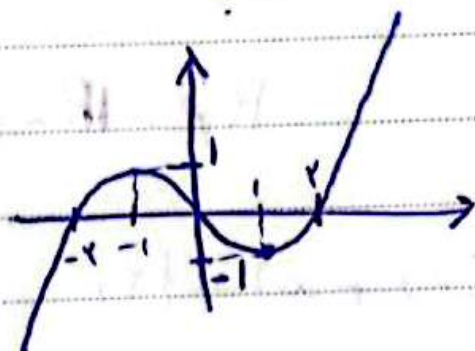
$$\frac{x-1}{x} \rightarrow R = \mathbb{R} - \left\{\frac{1}{x}\right\}$$

1-الف

$$|\mathbb{R} - \left\{\frac{1}{x}\right\}| = [0, +\infty) - \left\{\frac{1}{x}\right\}$$

$$\sqrt{\frac{1(x-1)}{x(x-1)}} \Rightarrow R_f = \left\{\frac{x}{x}\right\}$$

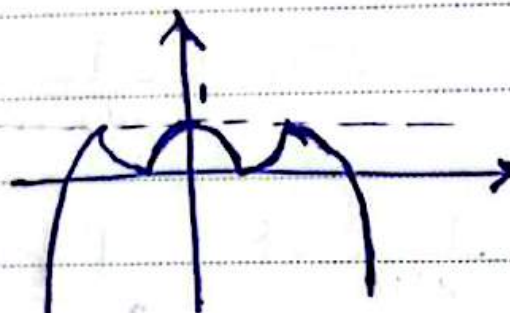
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$$R_f = \mathbb{R}$$

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$$f(x) = f(|x|)^*$$



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