

14, ۷۵

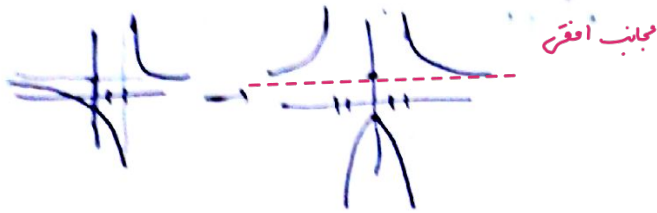
مسئله

روز دهم

علیرضا مومنی

(۷۵) ۱۱

$$y = \frac{\ln|t|}{\ln|t-1|} \quad \mathbb{R} = (-\infty, \frac{1}{e}] \cup (\frac{1}{e}, \infty)$$



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

$$\frac{x^2+1}{\ln x} \rightarrow \ln x + \frac{1}{\ln x} \xrightarrow{\ln x > 0} \mathbb{R} = [\frac{1}{e}, +\infty)$$

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$$y = \frac{x^3 + 3x^2 - 1}{x+3} \rightarrow \frac{x^3 + 3x^2 - 1}{x+3} = x-1 + \frac{1}{x+3} = x+3 + \frac{1}{x+3} - 4 \rightarrow \mathbb{R} = (-\infty, -4] \cup [-4, +\infty)$$

(۱) ۱۳

چون $x+3$ هم مثبت هم منفی

$$y = \frac{x^2 + 2x + \frac{1}{x}}{x^2 - x + 1} \quad \frac{(x-\frac{1}{x})^2}{(x-\frac{1}{x})^2 + \frac{4}{x}} \quad \frac{(x-\frac{1}{x})^2}{(x-\frac{1}{x})^2 + \frac{4}{x}} \geq 0 \rightarrow y \geq 0$$

$$(x-\frac{1}{x})^2 \geq 0 \rightarrow y \leq 1 \quad \mathbb{R} = [0, 1]$$

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$$\mathbb{R} = [0, 1]$$

$$D = x^2 - x + 1 \neq 0 \rightarrow \mathbb{R}$$

$$y = \sqrt{-x^2 - 6x - 1}$$

$$\sqrt{-(x^2 + 6x + 1)} \quad \mathbb{R}_y = \sqrt{(-\infty, 1]} = [0, \sqrt{1}]$$

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$$y = \sqrt[3]{x^2 - 4x}$$

$$x^2 - 4x \geq 0 \rightarrow x(x-4) \geq 0 \rightarrow x \in (-\infty, 0] \cup [4, +\infty)$$

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



$$\mathbb{R}_{x^2 - x + 1} = \mathbb{R} \rightarrow \mathbb{R}_{\lg(x^2 - x + 1)} = \mathbb{R}$$

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

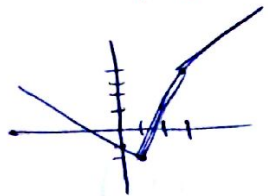
$$\mathbb{R}_{\frac{x^2+1}{x}} = (-\infty, 2] \cup [2, +\infty)$$

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

$$\mathbb{R}_f = [1, +\infty)$$

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$$y = |x-r| - |x-r'|$$



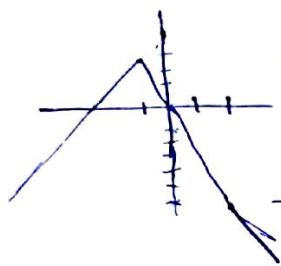
$$R_f = [-r, \infty)$$

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



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

$$|x-r| - |x+r| \leq 1$$



$$\begin{array}{c|c|c} -1 & r & \\ \hline x+\varepsilon & -r & -x-\varepsilon \end{array}$$

$$\begin{array}{l} x+\varepsilon \leq 1 \quad -r \leq 1 \quad -x-\varepsilon \leq 1 \\ x \leq -r \quad x \geq \frac{-1}{r} \quad x \geq -\varepsilon \\ -\infty < x \leq -r \quad \frac{-1}{r} < x \leq r \end{array}$$

$$R_f = (-\infty, -r] \cup [-\frac{1}{r}, +\infty)$$

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

$$\begin{array}{c|c|c} \frac{1}{r} & 0 & \\ \hline x+1 & -1 & x-1 \end{array}$$

شبه حرفه صفت



$$R_f = \mathbb{R}$$

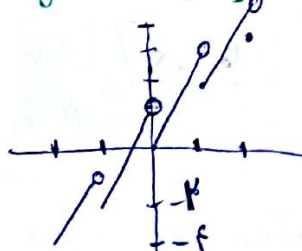
$$y = [x] + [r-x]$$



$$D = \mathbb{R}$$

$$R = \{r\}$$

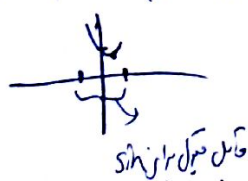
$$y = r[x] - [x]$$



$$R_f = [-\varepsilon, \infty)$$

$$y = \sin^r x - \sin x + 1$$

$$\text{مثال: } y = (\sin x - \frac{1}{r})^r + \frac{r}{\varepsilon}$$



$$\begin{array}{l} \sin x = 1 \rightarrow y = 1 \\ \sin x = -1 \rightarrow y = r \\ \sin x = \frac{b}{ra} = \frac{1}{r} \rightarrow \frac{r}{\varepsilon} \\ R_f = [\frac{r}{\varepsilon}, r] \end{array}$$

$$y = \sin^r x + \sin^r x + 1$$

$$\begin{array}{l} \sin^r x = 1 \rightarrow y = r \\ \sin^r x = 0 \rightarrow y = 1 \\ \sin^r x = \frac{b}{ra} = \frac{1}{r} \times \\ R = [1, r] \end{array}$$