

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



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

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

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

(دوون هم سبب هم منی)

$$y = \frac{x^2+2x+1}{x^2-x+1} \quad \frac{(x-\frac{1}{2})^2}{(x-\frac{1}{2})^2 + \frac{5}{4}} \xrightarrow{(x-\frac{1}{2})^2 \geq 0} \begin{cases} (x-\frac{1}{2})^2 = 0 \rightarrow y = 0 \\ (x-\frac{1}{2})^2 \rightarrow \infty \rightarrow y = 1 \end{cases} \rightarrow R = [0, 1]$$

$$R = [0, 1]$$

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

$$y = \sqrt{-x^2-5x-1} \quad R_f = \sqrt{(-\infty, 1]} = [0, \sqrt{1}]$$

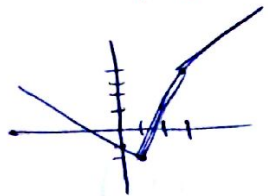
(x-1)^2 \geq 0

$$y = \sqrt[3]{x^2-2x-1} \quad \sqrt[3]{(x-1)^2-2} \quad \sqrt[3]{-1} = -1 \rightarrow R = [-1, +\infty)$$

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

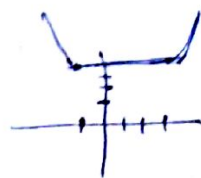
$$y = \lg \frac{x^2+1}{x} \quad R = \frac{x^2+1}{x} = (-\infty, -2] \cup [2, +\infty) \rightarrow \lg 1 = 1 \rightarrow R_f = [1, +\infty)$$

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



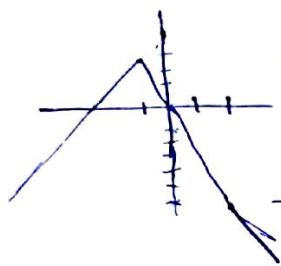
$$R_f = [-r, +\infty)$$

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



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

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



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

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

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

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

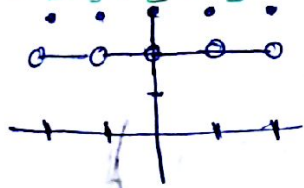
$$\begin{array}{c|c|c} \frac{1}{r} & 0 & \\ \hline \varepsilon x+1 & -1 & r x-1 \end{array}$$

سب حروف مثبت



$$R_f = \mathbb{R}$$

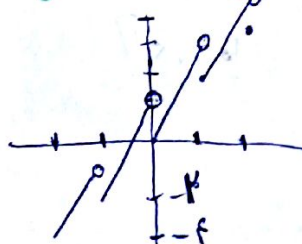
$$y = [x] + [r-x]$$



$$D = \mathbb{R}$$

$$R = \{r, r'\}$$

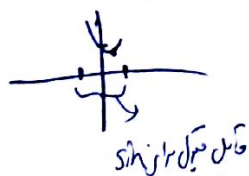
$$y = r[x] - [x]$$



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

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

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



$$\sin x = 1 \rightarrow y = 1$$

$$\sin x = -1 \rightarrow y = r$$

$$\sin x = \frac{b}{ra} = \frac{1}{r} \rightarrow \frac{r}{\varepsilon}$$

$$R_f = [\frac{r}{\varepsilon}, r]$$

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

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

$$\sin^r x = 0 \rightarrow y = 1$$

$$\sin^r x = \frac{b}{ra} = \frac{1}{r} \times$$

$$R = [1, r]$$