

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

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

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

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

$$2f(0) = 4 \rightarrow f(0) = 2$$

$$\hookrightarrow f(x) = x^2 - 2x + 2 \rightarrow f(x^2) = x^4 - 2x^2 + 2$$

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

$$\rightarrow x^2 + (1-2)x + 2 = 0 \rightarrow x = \frac{2-1 \pm \sqrt{2^2 - 4(1-2)}}{2} = \frac{1 \pm \sqrt{5}}{2}$$

$$\Rightarrow x = \frac{2-1 \pm \sqrt{2^2 - 4(1-2)}}{2} \hookrightarrow D_{f^+} = R_{f^+} = R - (-1, 1)$$

$$1) \quad x_s = \frac{\partial}{\partial} \rightarrow \partial_s = \frac{\partial}{\partial} \frac{\partial}{\partial} - \frac{\partial}{\partial} \frac{\partial}{\partial} + 1 = 1 - \frac{\partial}{\partial} = \frac{1}{\partial} \rightarrow R_{f^+} = \left[\frac{1}{\partial}, +\infty \right)$$

$$2) \quad \partial = \sqrt{g(x)} \rightarrow R_{g(x)} = \mathbb{R} \rightarrow R_{f^+} = \sqrt{R_{g(x)}} = [0, +\infty)$$

$$3) \quad R_{g(x)} = \mathbb{R} \rightarrow R_{f^+} = [0, +\infty)$$

$$4) \quad \partial = 1 + g(x) \rightarrow R_{f^+} = R_{g(x)} = \mathbb{R}$$

$$1) \quad \partial = \frac{1}{x} \rightarrow R_{f^+} = \mathbb{R} - \{0\} = \mathbb{R} - \left\{ \frac{1}{x} \right\}$$

$$2) \quad \sqrt{g(x)} \rightarrow R_{f^+} = \mathbb{R} - \{0\} \rightarrow R_{f^+} = [0, +\infty) - \{0\}$$

$$3) \quad \frac{x^2 + 1}{\sqrt{x^2 + 1}} = \sqrt{x^2 + 1} + \frac{1}{\sqrt{x^2 + 1}} \rightarrow R_{f^+} = \sqrt{x^2 + 1} + \frac{1}{\sqrt{x^2 + 1}} = \left[\frac{2}{\sqrt{2}}, +\infty \right)$$

$$1) \quad \partial = x + \frac{1}{x^2 + 1} \rightarrow \partial' = 1 - \frac{2x}{(x^2 + 1)^2} = 0 \rightarrow x = 0 \rightarrow \partial = 1$$

$$\min \partial = 1$$

$$g = \frac{ru^r + r}{u^r - 1} \rightarrow \partial u^r - g = ru^r + r \quad \vee (\partial - r)u^r = \partial + r$$

$$\rightarrow u^r = \frac{\partial + r}{\partial - r} > 0 \rightarrow D_{f^{-1}} = R_f = \boxed{(-r, r]}$$

$$y \leq u^r < +\infty \rightarrow \frac{\infty + r}{\infty - r} = r$$

$$\rightarrow \frac{r + r}{0 - r} = -r \quad \text{مخرج صفر شد}$$

$$(-\infty, -r] \cup \boxed{r, +\infty}$$

$$\rightarrow r = \frac{ru^r + r}{u^r - 1} \rightarrow -r = r$$

$$\square = \sin(\pi) \rightarrow \subset \text{دایره واحد}$$

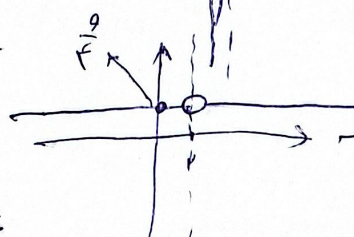
$$-1 \leq \square \leq 1 \rightarrow \frac{-r + r}{-1 - r} = \frac{r}{-r} = -\frac{1}{r} \quad \left\{ \begin{array}{l} [-r, -\frac{1}{r}] \\ \text{مخرج صفر شد} \end{array} \right.$$

$$\rightarrow \frac{r + r}{1 - r} = \frac{4}{-r} = -r$$

$$\text{الف) } g(x) = \frac{rx - 1}{fx} \rightarrow \frac{f}{f} \rightarrow f(x) \rightarrow$$

$$g(x) = \frac{gx - 1}{fx - 1}$$

$$\rightarrow g(x) = \frac{f}{f}$$



$$R = \{0, +\infty\}$$

$$R_f = \left\{ \frac{r}{f} \right\}$$

برعکس شطرنج
صفر بعد از ضرب
نسبت

$$n \rightarrow u^r - r \rightarrow$$

$$n \leq 0 \rightarrow -u^r - r$$

$$f(n):$$

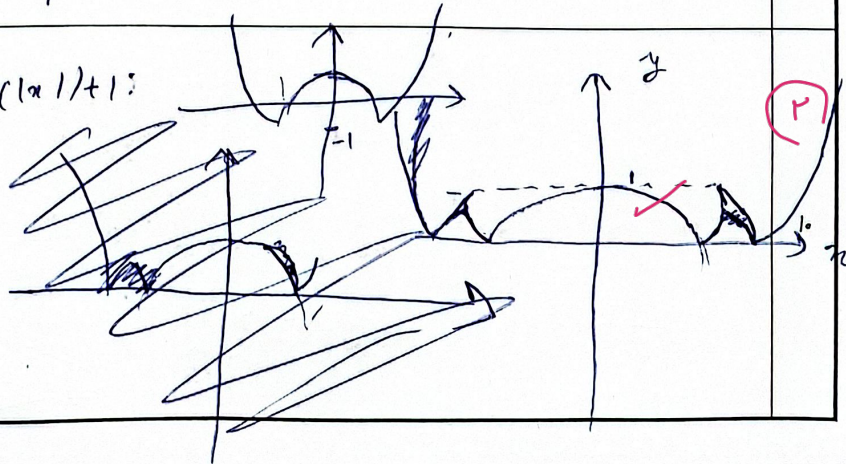
$$R_f = \mathbb{R}$$

$$f(n) = \left| \frac{x^r}{f} - r \right| - r$$

$$f(|x|) = f(n) \rightarrow f(|x| + 1)$$

$$g = \left| \left| \frac{x^r}{f} - r \right| - 1 \right|$$

$$\rightarrow g = |f(|x|) + 1| \rightarrow$$



۸- اول برد عبارت داخل قدر مطلق

رو حساب می‌کنیم بعد قدر مطلق می‌گیریم

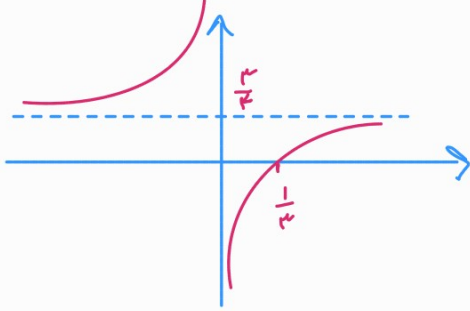
فقط حواسه باشه که $y = \frac{3}{4}$ هم هست داخل برد

$y = -\frac{3}{4}$ عضو برد عبارت داخل قدر مطلق هست و وقتی قدر مطلق بگیریم $y = \frac{3}{4}$

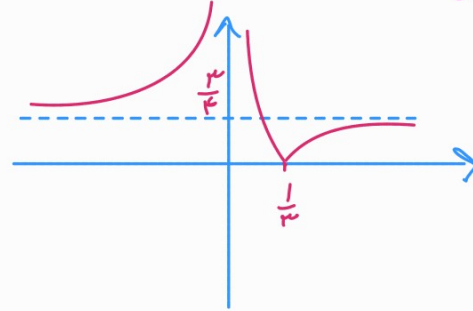
موجود بهمونه

$$R_y = |1R - \{\frac{3}{4}\}| = [0 + \infty)$$

$$y = \frac{x_n - 1}{x_n}$$



$\Rightarrow$



$$y = \left| \frac{x_n - 1}{x_n} \right|$$