

$$f(2x+1) + f(x+2) = 3x + f(3) \xrightarrow{\text{خطی}} a(2x+1) + b + a(x+2) + b = 3x + 3a + 2b$$

$$3ax + 3a + b = 3x + 3a$$

$$y = \sqrt{f(x) - x^2} = \sqrt{x - x^2} \rightarrow x - x^2 \rightarrow \text{ext} \left(\frac{1}{2}, \frac{1}{2} \right)$$

$$R_{x-x^2} = \left(-\infty, \frac{1}{4} \right]$$

$$R_y = \left[0, \frac{1}{2} \right]$$

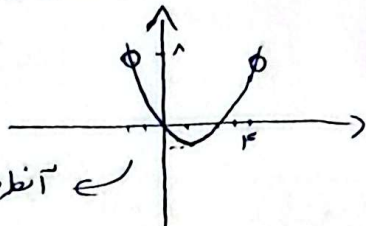
$b = 0$
 $a = 1$
 $f(x) = x$

$$f(x) = \frac{x^3 - 2x}{x+2} \rightarrow D_f = \mathbb{R} - \left\{ -2, b \right\} \quad R_f = [c, +\infty) - \{ \infty \}$$

$$x(x-2)(x+2) = x^3 - 2x^2 = 1$$

$y_{\text{ext}} = -1$
 $R_f = [c, +\infty) - \{ \infty \}$

$b = f(-2) = \frac{(-2)^3 - 2(-2)}{-2+2}$ (undefined)
 $f\left(\frac{-2+b}{-2-1}\right) = f(-1) = (-1)^3 - 2(-1) = 1$



$$y = \sqrt[3]{x^3 + ax^2 + bx} = 1 \xrightarrow{\text{خطی}} \sqrt[3]{x^3 - 6x^2 + 12x - 1} \rightarrow x - 2$$

$$\rightarrow a = -6, b = 12 \rightarrow D_y = [-6, 12] \xrightarrow{\text{خطی}} R_y = [(-6-2), (12-2)] \rightarrow$$

$$\rightarrow R_y = [-8, 10]$$

$$y = \left(\frac{x+1}{1-x} \right)^{\frac{1}{2}} \xrightarrow{\text{توان گیری}} \frac{x+1}{1-x} \geq 0 \rightarrow -1 + 1 - \rightarrow D_y = [-1, 1)$$

$$R_y = [-1, 1)$$

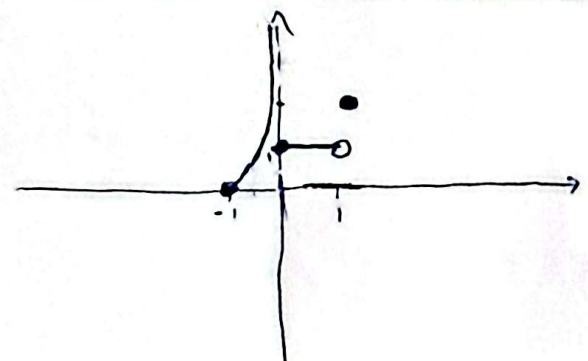
$$y = \frac{ax^2 - 1}{x^2 + b} \begin{cases} x^2_{\max} \rightarrow \infty \rightarrow a \rightarrow \text{خودش می تازد} \rightarrow a \leq 1 \\ x^2_{\min} \rightarrow 0 \rightarrow = -\frac{1}{b} \rightarrow \frac{1}{b} = 1 \rightarrow b = 1 \end{cases}$$

$$a + b = 2$$

$$\frac{[x]}{x} + \frac{|x|}{x} \quad D = [-1, 1]$$

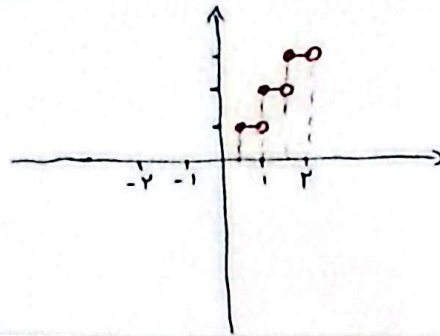
$$-1 \leq x < 0 \rightarrow \frac{-1}{x} + \frac{-x}{x} = \frac{-1-x}{x}$$

$$0 \leq x < 1 \rightarrow \frac{0}{x} + \frac{x}{x} = 1$$

$$x = 1 \rightarrow \frac{1}{x} + \frac{x}{x} = \frac{1+x}{x}$$


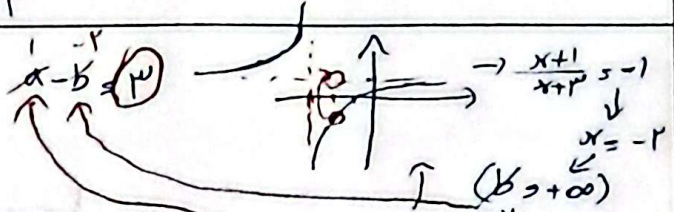
$$y = [x] + [x + \frac{1}{2}] \quad D_y = [\frac{1}{2}, 2)$$

$$\begin{aligned} \frac{1}{2} \leq x < 1 &\rightarrow 1 \\ 1 \leq x < \frac{3}{2} &\rightarrow 2 \\ \frac{3}{2} \leq x < 2 &\rightarrow 3 \end{aligned}$$



از ۳ پاره خط
تشکیل شده

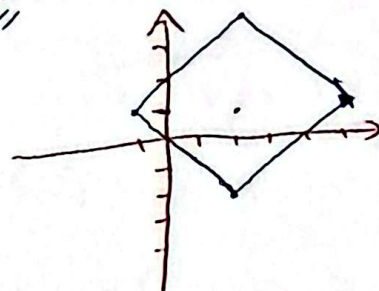
$$\left| \frac{x+1}{ax+3} \right| < 1 \quad (b > +\infty)$$



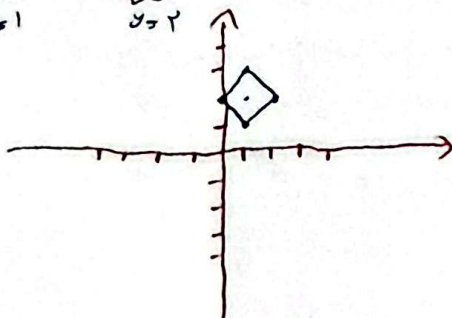
$$|x-2| + |y-1| = 3 \rightarrow -1 \leq x \leq 5 \quad -2 \leq y \leq 4$$

بیشتر یا کمتر میشود مقدار از
هم بیشتر شده و تا نوجه ۳
براکت بودن باید کم شدن نیست

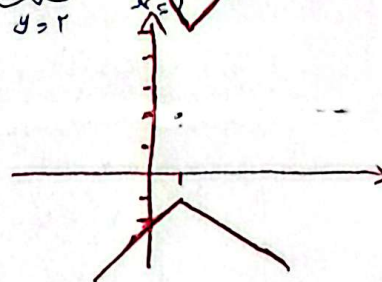
$$\begin{aligned} -1 \leq x \leq 2, 1 \leq y \leq 4 &\rightarrow y = x+3 \\ -1 \leq x \leq 2, -2 \leq y \leq 1 &\rightarrow -x = y \\ 2 \leq x \leq 5, 1 \leq y \leq 4 &\rightarrow y-x = 3 \\ 2 \leq x \leq 5, -2 \leq y \leq 1 &\rightarrow x-4 = y \end{aligned}$$



$$\text{الف) } |x-1| + |y-2| = 1$$



$$\text{ب) } |x-1| = |y-2| \Rightarrow x-1 = y-2 \text{ یا } x-1 = -(y-2)$$



$$y = 3x + |ax+b| \quad R_y = R \rightarrow \begin{aligned} (-\infty, -\frac{b}{a}) & \quad (3-a)x + b \\ [-\frac{b}{a}, +\infty) & \quad (3+a)x + b \end{aligned}$$

علامت شیب ۳ باید برابر باشد همچنین b باید کوچکتر مساوی صفر باشد

$$a \in (-3, 3)$$