

$$f(2x+1) = a(2x+1) + b = 2ax + a + b$$

$$f(x+2) = a(x+2) + b = ax + 2a + b$$

$$f(3) = 3a + b$$

$$3ax + 3a + 2b = 3x + 3a + b \rightarrow a = 1 \rightarrow 3a + 2b = 3a + b \rightarrow b = 0$$

$$f(x) = x$$

$$\sqrt{x - x^2} = y \quad -\frac{b}{2a} = \frac{1}{2} \quad R = \sqrt{(-\infty, \frac{1}{2}]} = \left[0, \frac{1}{2}\right]$$

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

$$D_f \neq \{-2, 4\}$$

$$-\frac{b}{2a} = -\frac{-2}{1} = 1$$

$$R_f = [1, +\infty) - \{1\}$$

$$f\left(\frac{a+b}{2c}\right) = f\left(\frac{-2+4}{1}\right) = f(1) = -1$$

$$x \in \mathbb{R} \rightarrow \mathbb{R}$$

$$R_f = \sqrt[3]{\mathbb{R}} = \mathbb{R}$$

$$D_1 = \mathbb{R} - \{1\} = R_1$$

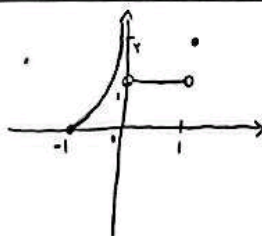
$$y_1 = \frac{ax^2 - 1}{x^2 + b} \rightarrow x = \pm \sqrt{\frac{by + 1}{a - y}} \rightarrow a = 1$$

$$y_1 = \frac{x^2 - 1}{x^2 + b} \rightarrow b = -1$$

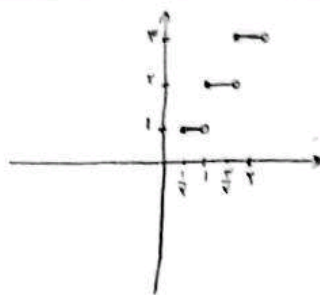
$$R_1 = \mathbb{R} - \{-1\} = D_1$$

$$a + b = 1 - 1 = 0$$

$$f(x) = \begin{cases} -1 < x < 0 & -\frac{1}{x} - 1 \\ 0 < x < 1 & 1 \\ x = 1 & 2 \end{cases}$$



$$f(x) = \begin{cases} \frac{1}{x} & x < 1 \\ 1 & 1 \leq x < \frac{3}{2} \\ \frac{3}{x} & \frac{3}{2} \leq x < 3 \end{cases}$$



بدرستی ۳

۶

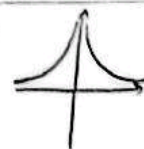
$$D = \mathbb{R} - \left\{ -\frac{3}{a} \right\} \quad R = \mathbb{R} - \left\{ \frac{1}{a} \right\}$$

$$\left| \frac{x+1}{ax+3} \right| \leq 1 \rightarrow -1 \leq \frac{x+1}{ax+3} \leq 1$$

$$\frac{(1-a)x-4}{ax+3} \leq 0$$

$$0 \leq \frac{(x+1)x+4}{ax+3}$$

$$y = \left| \frac{ax+b}{cx+d} \right| \rightarrow$$



۷

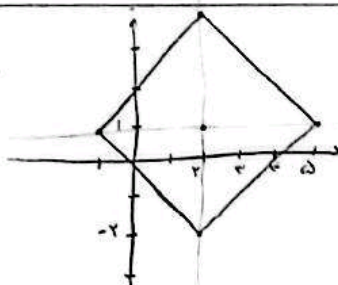
$$|x-2| + |y-1| = 3$$

$$\text{در ربع اول: } x-2+y-1=3 \rightarrow y=-x+6$$

$$\text{در ربع دوم: } -x+2+y-1=3 \rightarrow y=x+2$$

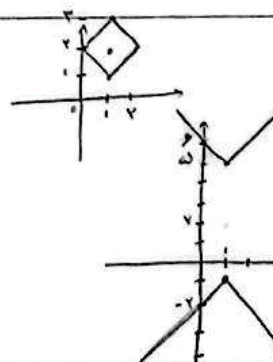
$$\text{در ربع سوم: } -x+2-y+1=3 \rightarrow y=-x$$

$$\text{در ربع چهارم: } x-2-y+1=3 \rightarrow y=x-4$$



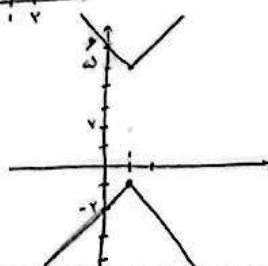
۸

$$\text{الف) } |x-1| + |y-2| = 1$$



$$\text{ب) } |x-1| - |y-2| = -3$$

$$|y-2| - |x-1| = 3$$



۹

$$f(x) = \begin{cases} x \geq -\frac{b}{a} & (a+3)x+b \\ x \leq -\frac{b}{a} & (3-a)x+b \end{cases}$$

$$a \geq 0 \quad (3-a)\left(-\frac{b}{a}\right) - b \geq (a+3)\left(-\frac{b}{a}\right) + b \rightarrow -\frac{3b}{a} \geq -\frac{3b}{a} \rightarrow \frac{b}{a} \leq \frac{b}{a}$$

$$a \leq 0 \quad (3-a)\left(-\frac{b}{a}\right) - b \leq (a+3)\left(-\frac{b}{a}\right) + b \rightarrow -\frac{3b}{a} \leq -\frac{3b}{a} \rightarrow \frac{b}{a} \geq \frac{b}{a}$$

$$a \neq 0 \quad a \in \mathbb{R} - \{0\}$$

۱۰