

$$f(x+1) + f(x+r) = r x + f(r) \xrightarrow{x=1} r f(r) = f(r) + r n \quad f(r) = r$$

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

$$f(1) + f(r) = r \rightarrow a + b + r a + b = r$$

$$\begin{matrix} r a + b = r \\ r a + r b = r \end{matrix} \rightarrow \begin{matrix} a = 1 \\ b = 0 \end{matrix} \rightarrow \begin{matrix} f(r) = a r + b \\ f(x) = x \end{matrix}$$

$$f(x) = \sqrt{x - x^2} \quad \frac{-b}{ra} = \frac{-1}{-r} = \frac{1}{r} \xrightarrow{x=\frac{1}{r}} \frac{1}{r} - \frac{1}{r^2} = \frac{1}{r}$$

$$Rf = \sqrt{(-\infty, \frac{1}{r})} = [0, \frac{1}{r}]$$

$$f(x) = \frac{x(x-r)(x+r)}{x+r} \quad x(x-r) = x^2 - rx \quad x(x-r) \neq 1 \quad f(x) = \frac{x^2 - rx}{x+r}$$

$$Rf = \mathbb{R} - \{-r, r\} \quad \begin{matrix} a = -r \\ b = r \end{matrix}$$

$$\begin{matrix} x \neq r \\ x+r \neq 0 \\ x \neq -r \end{matrix}$$

$$Rf = \frac{-b}{ra} = \frac{r}{r} = 1 \xrightarrow{x=1} f(x) = -1 \quad Rf = [-1, +\infty) \quad C = -1$$

$$f\left(\frac{a+b}{rc}\right) = f\left(\frac{-r+r}{-r}\right) = f(-1) \quad f(-1) = \psi$$

$$y = \sqrt{x^2 + ax^2 + bx - 1} = \sqrt{x^2 + 4x^2 + 12x - 1} = \sqrt{(x-2)^2} = (x-2)$$

$$\begin{matrix} a = -4 \\ b = 12 \end{matrix} \quad [-4, 12]$$

$$-4 \leq x \leq 12 \quad \underline{1 \leq x-2 \leq 10}$$

$$Rf = [-1, 10]$$

$$y_1 = \left(\frac{(x+1)}{(1-x)}\right)^{\frac{1}{2}}$$

$$\frac{x+1}{1-x} > 0 \quad \frac{-1}{-1} \quad \frac{1}{+1}$$

$$\begin{matrix} a = 1 \\ b = 1 \end{matrix} \quad \underline{a+b=2}$$

$$y_2 = \frac{ax^2 - 1}{x^2 + b}$$

$$x^2 = \frac{+by_2 + 1}{y_2 - a}$$

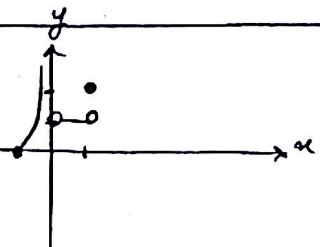
$$\rightarrow y = \sqrt{\frac{bx+1}{a-x}}$$

$$\frac{-1}{+1} \quad \frac{1}{+1}$$

$$y = \frac{[x]}{x} + \frac{|x|}{x}$$

$$\begin{matrix} -1 \leq x < 0 \\ 0 \leq x < 1 \\ x = 1 \end{matrix}$$

$$\begin{matrix} [x] = -1 \rightarrow \frac{-1}{x} - 1 \\ [x] = 0 \rightarrow 1 \\ [x] = 1 \rightarrow r \end{matrix}$$

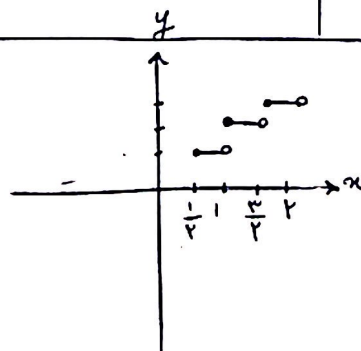


$$y = [x] + \left[x + \frac{1}{r}\right] \quad \left[\frac{1}{r}, r\right)$$

$$\frac{1}{r} \leq x < 1 \rightarrow \textcircled{1}$$

$$1 \leq x < \frac{r}{r} \rightarrow \textcircled{2}$$

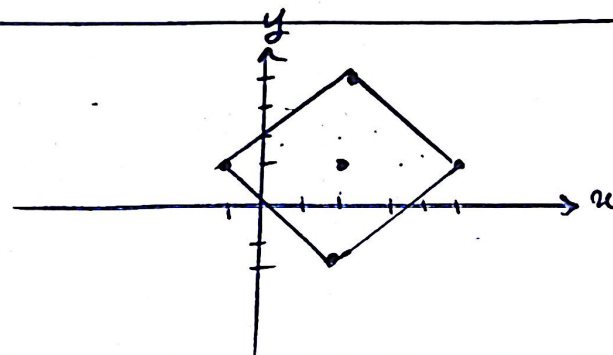
$$\frac{r}{r} \leq x < r \rightarrow \textcircled{3}$$



$$\left| \frac{x+1}{ax+3} \right| < 1$$

$$-1 < \frac{x+1}{ax+3} < 1$$

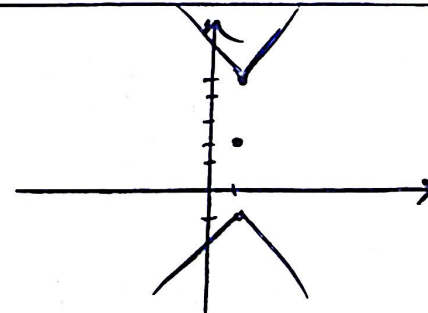
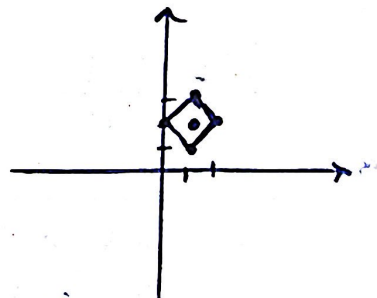
$$\begin{array}{ll} y > 1 & x > 2 \rightarrow y = -x + 5 \\ y < 1 & x > 2 \rightarrow y = x - 3 \\ y > 1 & x < 2 \rightarrow |x-2| + |y-1| \\ y < 1 & x < 2 \rightarrow y = x + 2 \\ & & y = -x \end{array}$$



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

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

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



$$y = 3x + |ax + b|$$

برای اینکه فقط یک خط داشته باشیم باید $a=0$ باشد
و مقدار b هم تا بی‌نهایت برابر نخواهد داشت.