

$$f(2x+1) + f(x+2) = 3x + f(3)$$

$$a(2x+1) + b + a(x+2) + b = 3x + 3a + b \Rightarrow (3a-3)x + b = 0 \rightarrow \begin{matrix} a=1 \\ b=0 \end{matrix}$$

is f(x)

$$y = \sqrt{x - x^2} : \begin{matrix} \text{max} \\ \text{min} \end{matrix} \left| \begin{matrix} \frac{1}{2} \\ \frac{1}{2} \end{matrix} \right| \rightarrow x = \frac{1}{2} \rightarrow y = \frac{1}{2} \rightarrow y \in \left[0, \frac{1}{2}\right]$$

$$f(x) = \frac{x^3 - 2x}{x+2} \quad D_f = \mathbb{R} - \{-2\} \quad R_f = [c, +\infty) - \{1\}$$

$$f(x) = \frac{x^3 - 2x}{x+2} \xrightarrow{x \neq -2} x^2 - 2x \rightarrow f(x) \neq 1 \rightarrow x^2 - 2x \neq 1 \rightarrow x \neq -1, 3$$

$$f(x) = x^2 - 2x \rightarrow \min = -1 \rightarrow c = -1 \rightarrow f\left(\frac{a+b}{2}\right) = f(-1) = 3$$

$$y = \sqrt{x^3 + ax^2 + bx - 1} = cx + d$$

$$x^3 + ax^2 + bx - 1 = c^3x^3 + 3c^2x^2d + 3cxd^2 + d^3 \rightarrow \begin{matrix} c=1 \\ d=-2 \end{matrix} \rightarrow \begin{matrix} a=-6 \\ b=11 \end{matrix}$$

$$y = x - 2 \quad x \in [-6, 11] \rightarrow y \in [-1, 1]$$

$$y_1 = \left(\frac{x+1}{1-x}\right)^{\frac{1}{2}} \rightarrow \frac{x+1}{1-x} > 0 \rightarrow -1 < x < 1$$

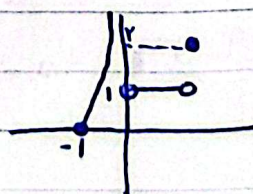
$$y_1 = \frac{ax^2 - 1}{x^2 + b} \rightarrow \begin{matrix} x^2 = 0 \rightarrow y_1 = -\frac{1}{b} \\ (x \rightarrow \infty) \rightarrow y_1 = a \end{matrix} \left\{ \begin{matrix} -\frac{1}{b} \leq y < a \\ a \leq y < -\frac{1}{b} \end{matrix} \right\} \rightarrow \begin{matrix} a=1, b=+1 \\ a=-1, b=-1 \end{matrix}$$

$$a+b=2$$

بنا را یاد ریشه در مخرج ندارد دست در می یابد

$$y = \frac{[x] + |x|}{x} \begin{cases} -\frac{x+1}{x} & -1 \leq x < 0 \\ 1 & 0 < x < 1 \\ 2 & x = 1 \end{cases}$$

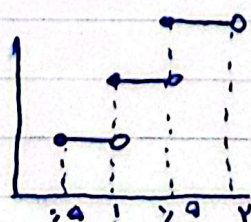
$$\frac{1}{x} + 1$$



$$y \in [-0, +\infty)$$

$$y = [x] + [x+2, 9]$$

$$\begin{cases} 1 & 0 \leq x < 1 \\ 2 & 1 \leq x < 2 \\ 3 & 2 \leq x < 3 \end{cases}$$



$$y = \left| \frac{x+1}{ax+3} \right| \rightarrow y < 1 \rightarrow \left| \frac{x+1}{ax+3} \right| < 1, x \rightarrow +\infty \rightarrow \left| \frac{1}{a} \right| \leq 1 \rightarrow |a| \geq 1 \rightarrow a \geq 1 \text{ or } a \leq -1 \quad (1)$$

$$y \in (b, +\infty) \rightarrow x=b, y=1 \rightarrow |b+1| = |ab+3|$$

$$\begin{array}{l} a > 0 \\ a < 0 \end{array}$$

برای اینکه صواب باشد a است

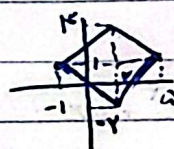
پس اعدادی وجود دارند $\rightarrow$ دایره صورت $\rightarrow$ فرض کنیم $a > 1$
 قبل از جانب محوره و چرا $\rightarrow$ پس $a \leq 1$ است
 جانب افقی زیر می رود $\rightarrow$ قبل از جانب محوره و چرا
 که دهنه را دانی بعد از آن

$$|b+1| = |ab+3| \rightarrow b^2 + 2b + 1 = b^2 + 6b + 9 \rightarrow b = -2 \rightarrow a - b = 3$$

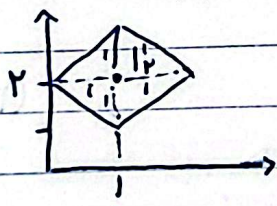
$$|x-2| + |y-1| = 3$$

$$x > 2, y > 1 : x+y=6 \quad x > 2, y \leq 1 \rightarrow x-y=4$$

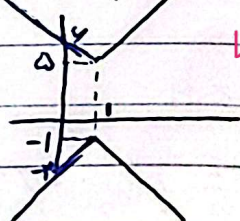
$$x \leq 2, y > 1 : y-x=2 \quad x \leq 2, y \leq 1 \rightarrow y=-x$$



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



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



$$y = 3x + |ax+b| \begin{cases} (a+3)x+b : x \geq -\frac{b}{a} \\ (3-a)x-b : x \leq -\frac{b}{a} \end{cases}$$

$$(a+3)(3-a) \geq 0 \rightarrow 9 - a^2 \geq 0 \rightarrow -3 \leq a \leq 3 \rightarrow a \in [-3, 3]$$