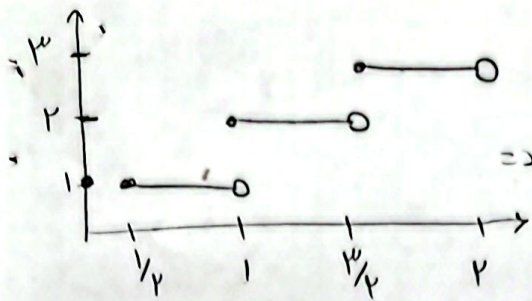


-٤



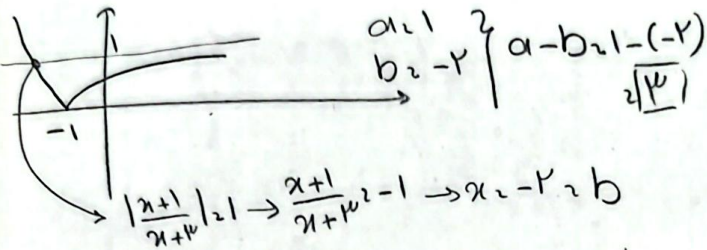
$\Rightarrow \frac{1}{2}, \frac{3}{2}$

$$x = \frac{1}{4} \rightarrow y = \{1\} + \{1\} = 1$$

$$x = 1 \rightarrow y = \{1\} + \{3/4\} = 2$$

$$x = \frac{19}{10} \rightarrow y = \{2\} + \{1/10\} = 3$$

$$a \geq 1 \Rightarrow \left| \frac{x+1}{x+2} \right| \quad \frac{1}{a} \geq 1, 2-a > 0$$



$$\begin{cases} a = 1 \\ b = -2 \end{cases} \Rightarrow a - b = 1 - (-2) = 3$$

-٧

$$\begin{aligned} x &\mapsto f(x) + f(x) = x + f(x) \rightarrow f(x) = x \\ y &= ax + b \rightarrow y = ax + a + b + ax + a + b = 2x + 2 \\ 2ax + 2a + 2b &= 2x + 2 \Rightarrow 2ax = 2x \rightarrow a = 1 \\ 2 \cdot 1 + 2b &= 2 \rightarrow b = 0 \end{aligned}$$

$$y = \sqrt{-x^2 + x} \rightarrow \text{ext} \left| \frac{-1}{-2} \right| = \frac{1}{4}$$

$$\Rightarrow \text{Dom} [0, 1/4]$$

-٧

$$f(x) = \frac{x(x+2)(x-2)}{x+2} \rightarrow x \neq -2$$

$$\begin{aligned} x^2 - 2x &\neq 1 \rightarrow x^2 - 2x - 1 \neq 0 \rightarrow (x-1)(x+1) \neq 0 \\ \Rightarrow \text{Dom} \mathbb{R} \setminus \{-2, 1\} \end{aligned}$$

$$x^2 - 2x \rightarrow \text{ext} \left| \frac{1}{-1} \right| \rightarrow \text{Dom} [-1, +\infty) \setminus \{1\}$$

$$f\left(\frac{x-2}{x(-1)}\right) = -1 \rightarrow \frac{-1+x}{-1+x} \sqrt{2}$$

$$y = \sqrt{(x-2)^2} = \sqrt{x^2 - 4x + 4} = |x-2| \Rightarrow \text{Dom} [-2, 2]$$

$$y = x-2 \rightarrow \text{Dom} [-2, 2] \Rightarrow \text{Dom} [-1, 1]$$

$$\frac{x+1}{1-x} \geq 0 \rightarrow \frac{-1}{-1+\frac{1}{x}} \rightarrow \text{Dom} [-1, 1)$$

-٤

$$y = \frac{ax^2-1}{x^2+b} \rightarrow x^2 = 0 \rightarrow \frac{-1}{b} = -1 \rightarrow b = 1$$

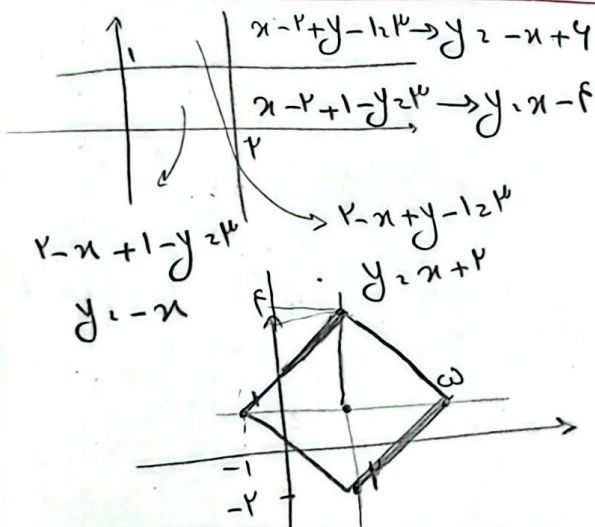
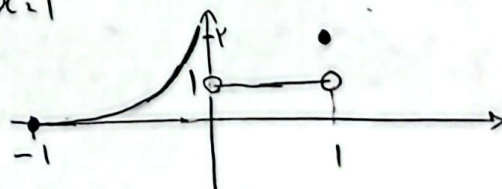
$$\Rightarrow a+b = 2$$

$$-1 \leq x \leq 0 \rightarrow \frac{-1}{x} - 1$$

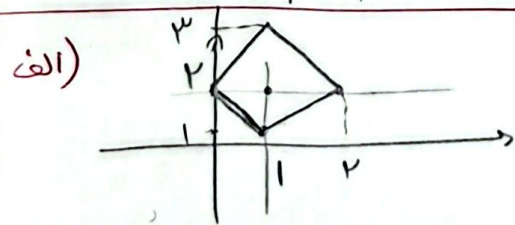
-٥

$$0 \leq x \leq 1 \rightarrow 0 + 1 = 1$$

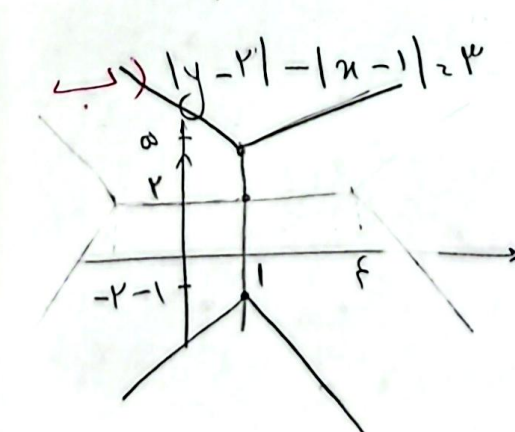
$$x = 1$$



-٨



-٩



(الف)

۱۵- α باید عددی بین -3 تا 3 باشد تا دایره وارده

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

تغییر می شود و دایره وارده صعودی تا برداشتن P است و در غیر این صورت یک خط با شیب مثبت به ما می دهد و یک خط با شیب منفی که در P برده می شود.

$$\Rightarrow \alpha \in (-3, 3)$$