

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره (۱) ... کلاس (۱۳۹۸) ...

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

$$\Rightarrow 2ax + a + b + ax + 2a + b = 3x + 3 \Rightarrow x(2a) + 3a + 2b = 3x + 3$$

$$2a = 3 \Rightarrow a = 1.5, \quad 3a + 2b = 3 \Rightarrow 4.5 + 2b = 3 \Rightarrow 2b = -1.5 \Rightarrow b = -0.75$$

$$f(x) = 1.5x - 0.75$$

$$y = \sqrt{x - x^2} \quad \left| \begin{array}{l} -\frac{b}{2a} = \frac{1}{4} \\ y_{max} = \frac{1}{4} \end{array} \right. \Rightarrow R = \sqrt{(-\infty, \frac{1}{4}]} \Rightarrow R_f = [0, \frac{1}{4}]$$

$$f(x) = \frac{x^3 - 2x}{x+2} = \frac{x(x^2 - 2)}{x+2} = x(x-2) = x^2 - 2x \xrightarrow{x=-2} \text{باید یقین از دیگر} \xrightarrow{x^2 - 2x = 8} x^2 - 2x - 8 = 0$$

$$\Rightarrow (x-4)(x+2) = 0 \Rightarrow x = 4, -2 \Rightarrow a, b = -2, 4$$

$$f(x) = x^2 - 2x \quad \left| \begin{array}{l} -\frac{b}{2a} = 1 \\ -1 \end{array} \right. \rightarrow R_f = [-1, +\infty) - \{1\}$$

$$f\left(\frac{4-2}{-2}\right) = f(-1) = \frac{-1+4}{1} = 3$$

$$y = \sqrt{x^3 + ax^2 + bx - 1} \xrightarrow{\text{باید یقین از دیگر}} y = \sqrt{(x-2)^3} = \sqrt{x^3 - 6x^2 + 12x - 8} \Rightarrow R_y = [-4, 12]$$

$$y = x - 2 = R_f = [-1, 10]$$

$$y_1 = \left(\frac{x+1}{1-x}\right)^{\frac{1}{2}} \Rightarrow \frac{x+1}{1-x} \geq 0 \quad \left| \begin{array}{c} -1 \quad 1 \\ x+1 \quad x-1 \end{array} \right| \Rightarrow -1 \leq x < 1$$

$$y_2 = \frac{ax^2 - 1}{x^2 + b} \Rightarrow y_2 x^2 + b y_2 = ax^2 - 1 \Rightarrow ax^2 - y_2 x^2 = b y_2 + 1 \Rightarrow x^2(a - y_2) = b y_2 + 1$$

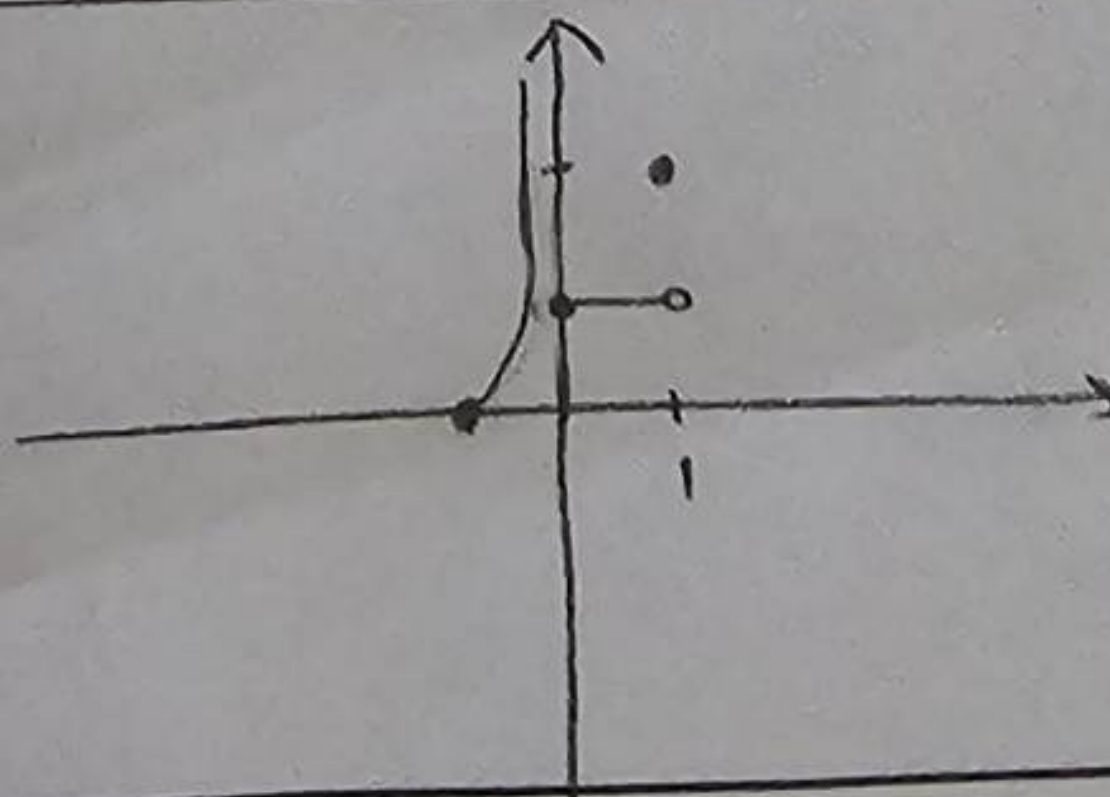
$$\Rightarrow x^2 = \frac{b y_2 + 1}{a - y_2} \Rightarrow x = \sqrt{\frac{b y_2 + 1}{a - y_2}} \Rightarrow \frac{b y_2 + 1}{a - y_2} \geq 0 \Rightarrow a + b = 3$$

$$[-1, 1] \quad \frac{[x]}{x} + \frac{|x|}{x}, \quad x \neq 0$$

$$x \in [-1, 0) \Rightarrow y = \frac{-1}{x} + \frac{-x}{x} = -\frac{1}{x} - x$$

$$x \in (0, 1) \Rightarrow y = \frac{0}{x} + \frac{x}{x} = 1$$

$$x = 1 \Rightarrow y = 2$$

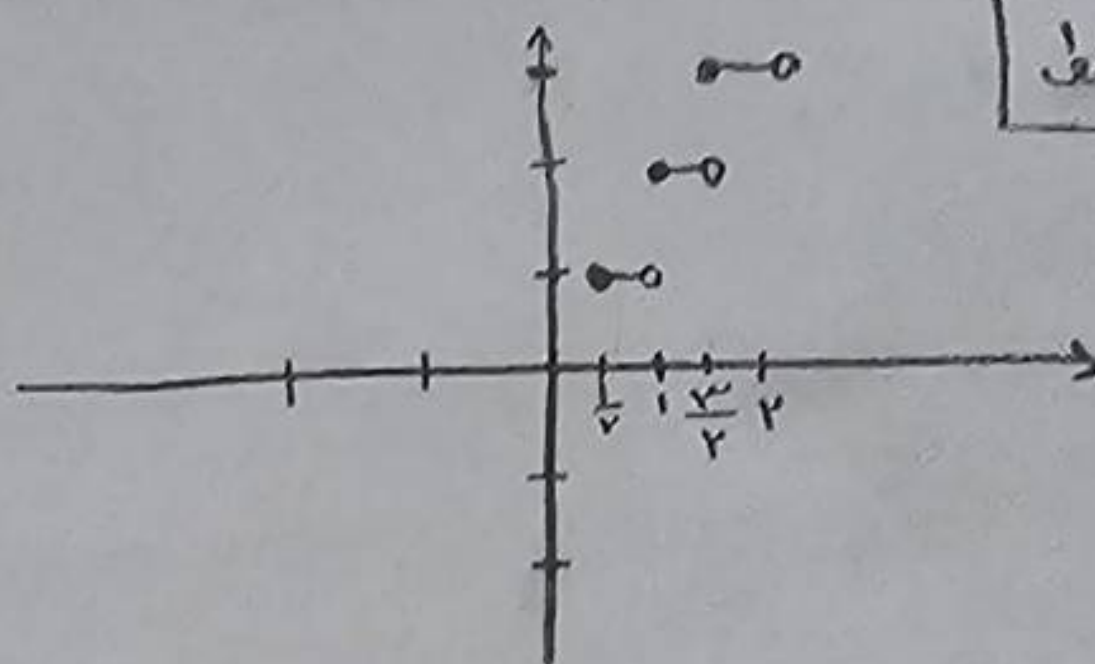


$$y = [x] + [x + \frac{1}{2}] \quad [1, 2)$$

$$\frac{1}{2} \leq x < 1 \Rightarrow y = 0 + 1 = 1$$

$$1 \leq x < \frac{3}{2} \Rightarrow y = 1 + 1 = 2$$

$$\frac{3}{2} \leq x < 2 \Rightarrow y = 1 + 2 = 3$$



$$\left| \frac{x+1}{ax+3} \right| < 1 \Rightarrow -1 < \frac{x+1}{ax+3} < 1 \quad \left[\begin{array}{l} \frac{x+1}{ax+3} > -1 \Rightarrow \frac{x+1+ax+3}{ax+3} > 0 \Rightarrow \frac{x(a+1)+4}{ax+3} > 0 \quad (1) \\ \frac{x+1}{ax+3} < 1 \Rightarrow \frac{x+1-ax-3}{ax+3} < 0 \Rightarrow \frac{x(1-a)-2}{ax+3} < 0 \quad (2) \end{array} \right.$$

$$x \neq -\frac{3}{a}$$

$$\text{If } a=1 \Rightarrow (1) \quad \frac{-2}{x+3} < 0 \Rightarrow x+3 > 0 \Rightarrow x > -3, (2) \quad \frac{x+5}{x+3} > 0 \Rightarrow (x+5)(x+3) > 0 \Rightarrow x < -3 \cup x > -2$$

$$* \cap * = (-2, +\infty) \Rightarrow a=1 \rightarrow \text{فقط} \quad \left. \begin{array}{l} b=-2 \\ a-b=1-(-2)=3 \end{array} \right\}$$

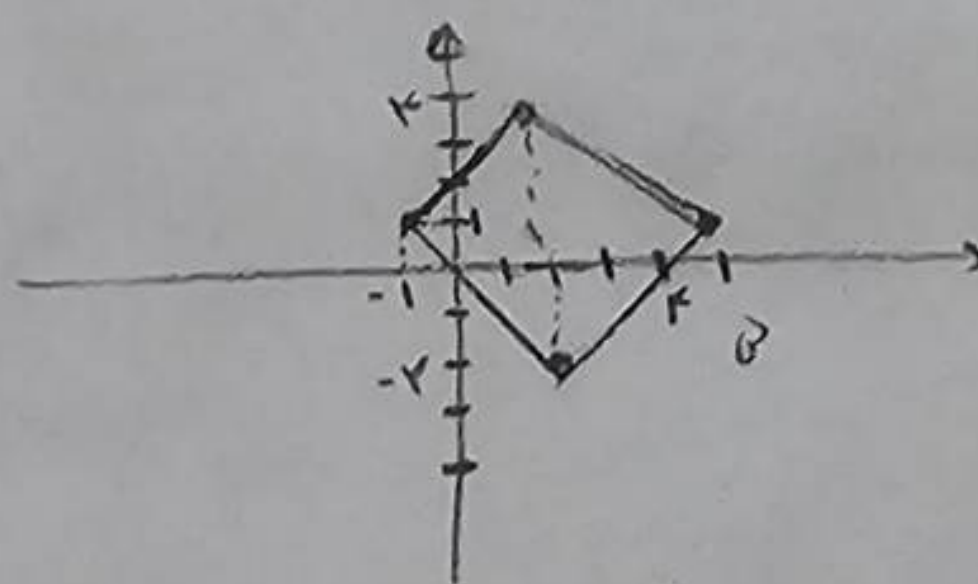
$$|x-2| + |y-1| = 3$$

$$x > 2, y > 1 \Rightarrow x-2+y-1=3 \Rightarrow y = -x+6$$

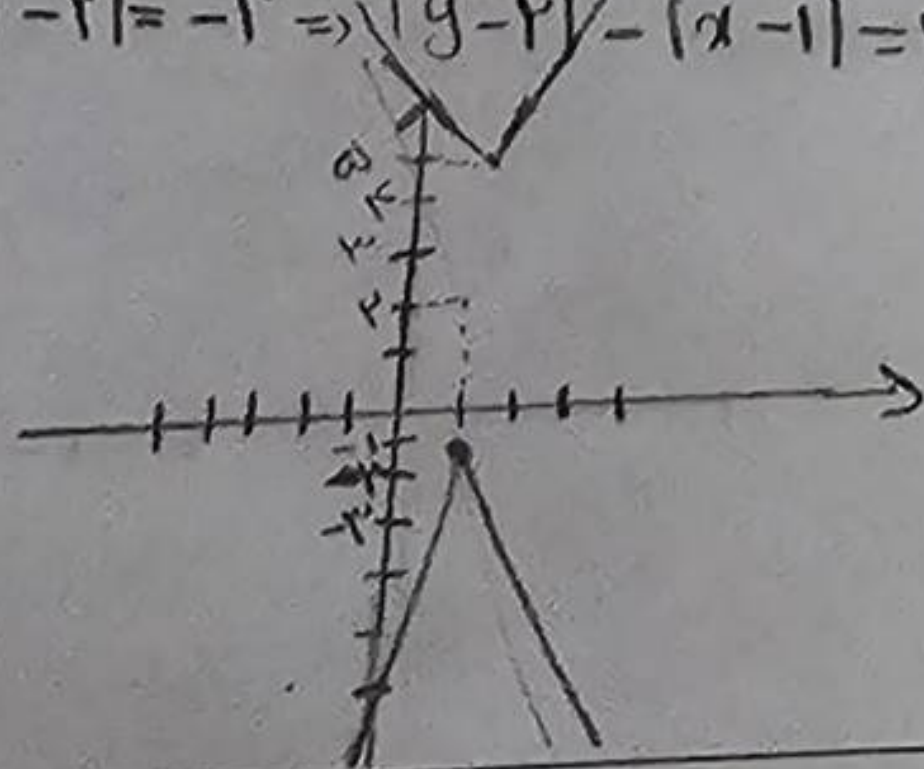
$$x < 2, y < 1 \Rightarrow 2-x+1-y=3 \Rightarrow y = -x$$

$$x > 2, y < 1 \Rightarrow x-2-y+1=3 \Rightarrow y = x-4$$

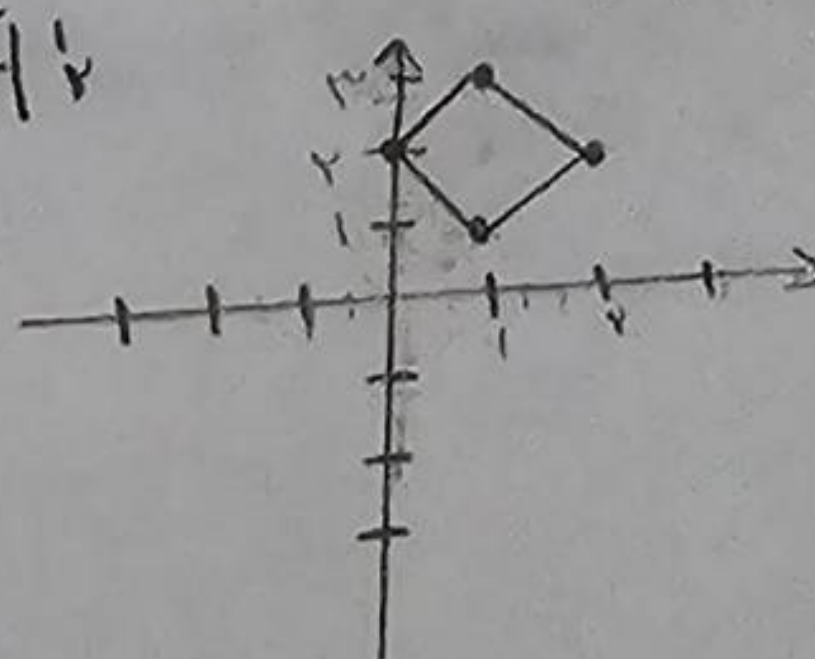
$$x < 2, y > 1 \Rightarrow 2-x+y-1=3 \Rightarrow y = x+2$$



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



$$|x-1| + |y-2| = 1 \rightarrow \text{دايره است به مرکز (1, 2) و شعاع 1/2}$$



برای افتد برد R باشد باید سبکی + دیگری - باشد

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

$$y \begin{cases} x(3+a)+b \geq 0 \\ x(3-a)-b \leq 0 \end{cases} \quad \left\{ \begin{array}{l} 3+a > 0, 3-a < 0 \Rightarrow a > 3, a > -3 \\ 3+a < 0, 3-a > 0 \Rightarrow a < 3, a < -3 \end{array} \right. \quad \left\{ \begin{array}{l} \text{مقدار} \\ a \end{array} \right. = (-\infty, -3) \cup (3, +\infty)$$