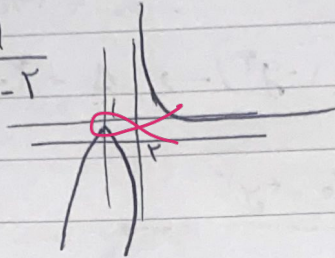


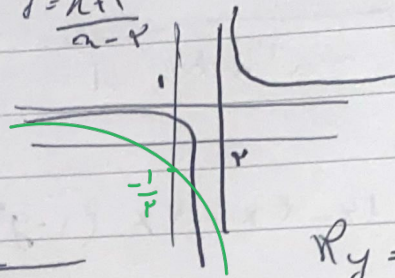
از نقطه $(\frac{1}{2}, -\frac{1}{2})$ می‌گذرد!

$$y = \frac{|x|+1}{|x|-2}$$

$$y = \frac{|x|+1}{|x|-2}$$



$$y = \frac{x+1}{x-2}$$



در سامانه

(۱)

$$R_y = \mathbb{R} \setminus \{2\}$$

$$y = \frac{x^2+1}{|x|}$$

$$x > 0 \rightarrow \frac{x^2+1}{x} = x + \frac{1}{x} \rightarrow x + \frac{1}{x} \geq 2$$

$$x < 0 \rightarrow \frac{x^2+1}{-x} = -x + \frac{1}{-x} \rightarrow -x + \frac{1}{-x} \leq -2$$

$$x + \frac{1}{x} \geq 2 \rightarrow \mathbb{R}^+ [2, +\infty)$$

صفحه آخر...

$$y = \frac{x^2+x-2}{x+2}$$

$$y(x+2) = x^2+x-2 \rightarrow x^2+(x-y)-2-y$$

$$\Delta = (x-y)^2 - 4(-2-y) = y^2 - 4y + 8 + 4y = y^2 + 4y + 8 = (y+2)^2$$

$$x = \frac{y - (-2) \pm \sqrt{(y+2)^2}}{2} = \frac{y+2 \pm (y+2)}{2}$$

$$R = (-\infty, -2] \cup [-2, +\infty)$$

$$y = \frac{x^2-x+1}{x^2-x+1}$$

$$D_y \rightarrow x^2-x+1 \neq 0 \rightarrow \Delta = 1-4 = -3 < 0$$

(۳)

(۲)

$$R_y = y(x^2-x+1) = x^2-x+1 \rightarrow (1-y) + 2(y-1) + \frac{1}{2} - y = 0$$

$$\Delta = (y-1)^2 - 4(1-y)(1-y) = y^2 - 2y - 4y^2 + 8y + 1 = -3y^2 + 6y + 1$$

$$x = \frac{1-y \pm \sqrt{-3y^2+6y+1}}{2-y}$$

$$R_y = [2, 3]$$

dn

درس سادگی

Date

No

$$y = \sqrt{-x^2 + 4x - 1}$$

سهم اندیشه خوب برد

$$y^2 = -x^2 + 4x - 1$$

(۵)

$$-x^2 + 4x - 1 - y^2 = 0$$

چقدر سخت!

$$\Delta = 16 - 4 \times (-1) \times (-1 - y^2) \rightarrow \Delta = 12 - 4y^2$$

$$x = \frac{-4 \pm \sqrt{12 - 4y^2}}{-2}$$

$$\frac{-\sqrt{3} \pm \sqrt{3}}{-2}$$

$$y = \sqrt{4x^2 - 12x}$$

$$y^2 = 4x^2 - 12x$$

$$4x^2 - 12x - y^2 = 0$$

$$\Delta = 144 - 4 \times (-12) \times (-y^2) = 144 - 48y^2 = 48(3 - y^2)$$

$$x = \frac{12 \pm \sqrt{48(3 - y^2)}}{8}$$

$$y = 2$$

$$\frac{12 \pm \sqrt{48(3 - 4)}}{8}$$

$$Ry = (-\infty, \sqrt{3}]$$

روند

صفحه آخر...

$$y = \log \frac{x^2 - x + 1}{x}$$

$$Ry = (-\infty, 1)$$

راجل افق!

(۱)

$$y = \log \frac{x^2 + 1}{x}$$

$$\frac{x^2 + 1}{x} > 0 \quad x > 0$$

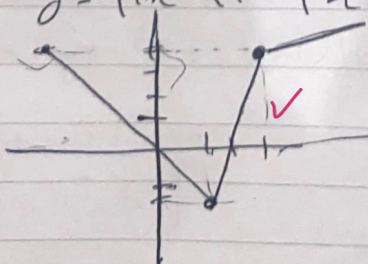
(۲)

$$x + \frac{1}{x} \geq 2$$

$$y = \log [2, +\infty)$$

$$Ry = [1, +\infty)$$

$$f(x) = y = |x - 1| - |x - 2|$$



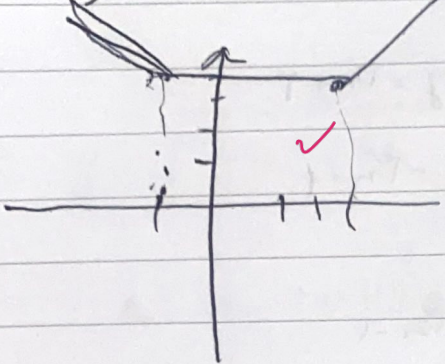
$x - 2 \geq 0$	$x - 2 < 0$	$x - 2 \geq 0$
$x - 1 \geq 0$	$x - 1 \geq 0$	$x - 1 < 0$
$x - 2 - x + 1 = -1$	$x - 2 - x + 1 = -1$	$x - 2 - x + 1 = -1$
$x - 2 - x + 1 = -1$	$x - 2 - x + 1 = -1$	$x - 2 - x + 1 = -1$

(۱, ۵)

$$Ry = [-1, +\infty)$$

رسم هادی

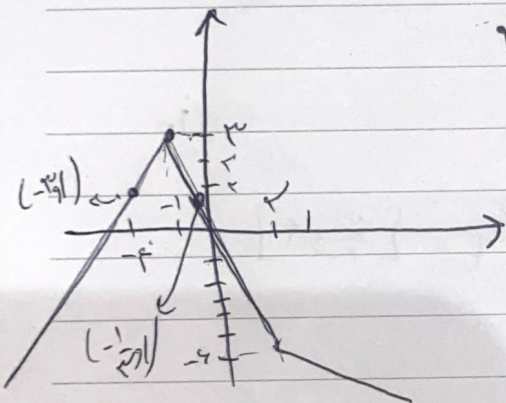
$$y = |x-2| + |x+1|$$



$x < -1$	$-1 \leq x < 2$	$x \geq 2$
$x - x - 2 - 1 = -x - 3$	$x - x + 2 + 1 = 3$	$x - x + 2 + 1 = 3$

$$R_f = [-\frac{3}{2}, +\infty)$$

↖



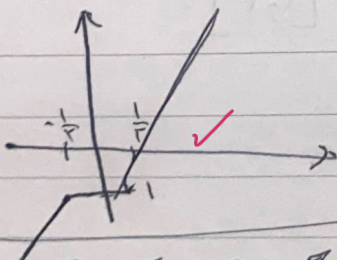
$x < -1$	$-1 \leq x < 2$	$x \geq 2$
$x - x + 2 - 1 = x + 1$	$x - x - 2 - 1 = -x - 3$	$x - x - 2 - 1 = -x - 3$

(1, 2)

$$R_f = \mathbb{R} - \left[-\frac{3}{2}, -\frac{1}{2}\right]$$

له این خود شغل تو برداشت

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



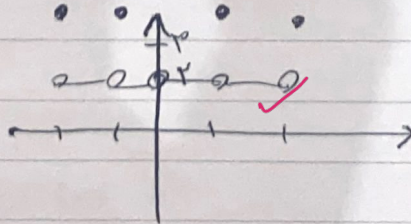
$x < -1$	$-1 \leq x < 0$	$0 \leq x < 2$	$x \geq 2$
$x - x + 2 - 1 + x = x + 1$	$x - x - 2 - 1 + x = -x - 3$	$x - x - 2 - 1 + x = -x - 3$	$x - x - 2 - 1 + x = -x - 3$

(1, 2)

$$R_f = \mathbb{R}$$

$$\omega = y = [x] + [x-2] = [x] + [-x] + 2$$

(1, 2)



$$R_y = \{2, 3\}$$

$$1) y = 2n - [n]$$

$$-1 \leq n < 0 \rightarrow [n] = -1 \rightarrow y = 2n + 1$$

$$0 \leq n < 1 \rightarrow [n] = 0 \rightarrow y = 2n$$

$$1 \leq n < 2 \rightarrow [n] = 1 \rightarrow y = 2n - 1$$

$$n = 2 \rightarrow y = 3$$

$$R_f = [-1, 2)$$

$$2) y = \sin^2 n - \sin n + 1$$

(10)

$$\sin n = 1 \rightarrow 1 - 1 + 1 = 1$$

$$\sin n = -1 \rightarrow 1 + 1 + 1 = 3$$

$$\sin n = \frac{1}{2} \rightarrow \frac{1}{4} - \frac{1}{2} + 1 = \frac{3}{4}$$

$$R_f = [\frac{3}{4}, 3]$$

(2)

$$3) y = \sin^2 n + \sin n + 1$$

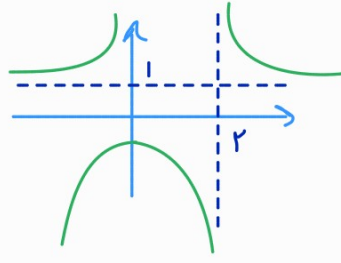
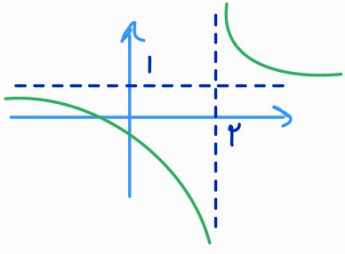
$$\sin^2 n = 0 \rightarrow 0 + 0 + 1 = 1$$

$$\sin^2 n = 1 \rightarrow 1 + 1 + 1 = 3$$

$$\sin^2 n = \frac{1}{4}$$

$$R_f = [1, 3]$$

الف) $\square = |x| \rightarrow \begin{cases} |x| = 0 \rightarrow y = \frac{-1}{2} \\ |x| = +\infty \rightarrow y = 1 \end{cases} \xrightarrow[\text{مفردته}]{\text{محددات قيمته}} R_y = (-\infty, \frac{-1}{2}] \cup (1, +\infty)$ - 1



الف) $\max \left| \begin{array}{l} \frac{-b}{2a} = 2 \\ y = 3 \end{array} \right. \Rightarrow R_y = \sqrt{(-\infty, 3]} = [0, \sqrt{3}]$ - 2

ب) $\min \left| \begin{array}{l} \frac{-b}{2a} = 2 \\ y = -1 \end{array} \right. \Rightarrow R_y = \sqrt{[-1, +\infty)} = [-1, +\infty)$