ماهگان میر منقدایی ← لطفاً پس زمینه مشکی نباشد

۱۹,۲۵

۱ ←

$$\frac{1}{x-1} = |x-1| \xrightarrow{x>1} \frac{1}{x-1} = x-1$$

$$\to \cancel{1} = x^2 - 2x + \cancel{1}$$

$$\to x^2 - 2x = 0 \to x(x-2) = 0$$

$$\to x = 0 \ , \ x = 2$$

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$$\xrightarrow{x<1} \frac{1}{x-1} = 1-x \to$$

$$1 = -(x-1)^2 \xrightarrow{\times -1}$$

$$-1 = x^2 - 2x + 1 \to$$

$$x^2 - 2x + 2 = 0 \to$$

$$\Delta = 4 - 8 = -4 \to$$ ریشه ندارد

$$\to \boxed{x = 2}$$

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۲ ← الف ← $\left|\frac{2x-1}{x}\right| < 2 \to -2 < \frac{2x-1}{x} < 2$

$$\rightarrow -2 < \frac{2x-1}{x} \rightarrow \frac{2x-1}{x} + 2 > 0$$

$$\frac{2x-1+2x}{x} > 0 \rightarrow \frac{4x-1}{x} > 0$$

$\rightarrow$

	0		$1/4$	
$+$	∄	$-$	0	$+$

(1)

$$\rightarrow \frac{2x-1}{x} < 2 \rightarrow \frac{2x-1}{x} - 2 < 0$$

$$\rightarrow -\frac{1}{x} < 0 \rightarrow 1/x > 0 \rightarrow x > 0 \quad (2)$$

(1) $\cap$ (2) $\rightarrow$ $x > 1/4$ یا $x \in (1/4, +\infty)$ ✓

[illegible] ۱,۷۵

$$\left|\frac{x-2}{2x+1}\right| > 1 \rightarrow \frac{x-2}{2x+1} > 1 \rightarrow$$

$$\frac{x-2-2x-1}{2x+1} > 0 \rightarrow \frac{-x-3}{2x+1} > 0$$

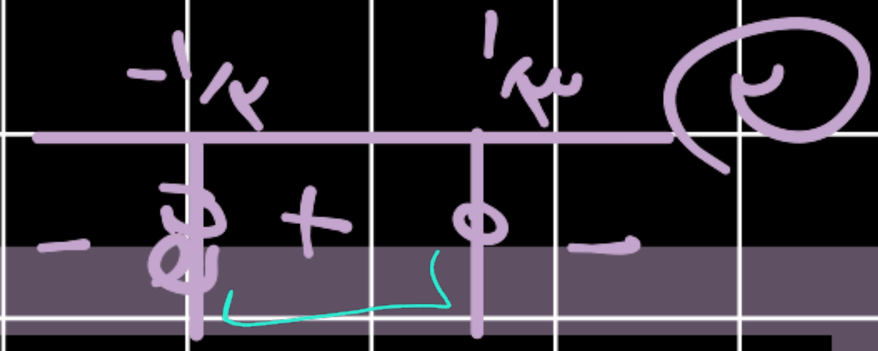
$\rightarrow$

	-3		$-1/2$	
$-$	0	$+$	∄	$-$

(3)

$$\frac{x-2}{2x+1} < -1 \longrightarrow \frac{x-2+2x+1}{2x+1} < 0$$

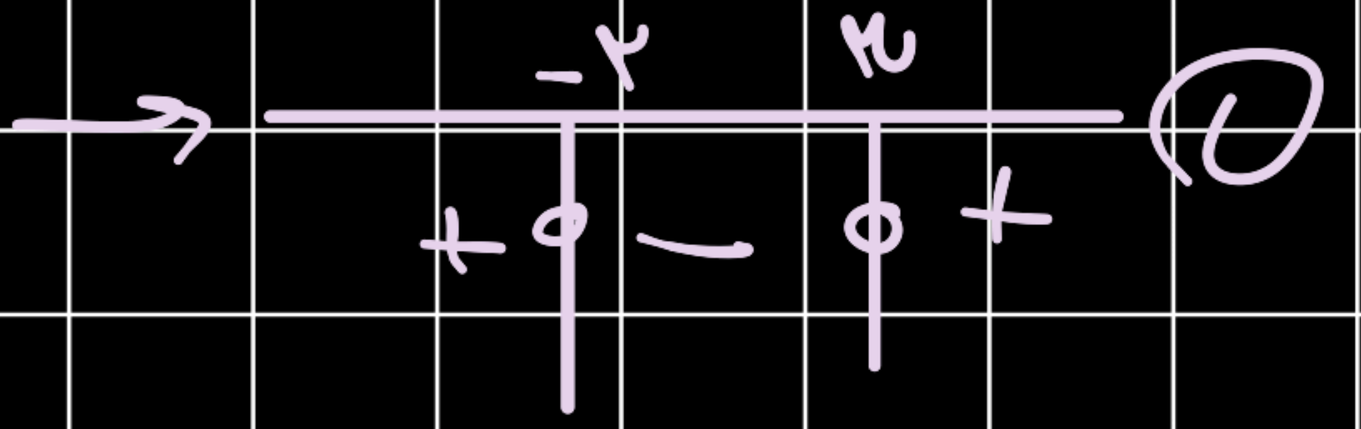
$$\frac{3x-1}{2x+1} < 0 \longrightarrow$$



$$\xrightarrow{\cap} -\frac{1}{2} < x < \frac{1}{3} \quad \left(-\frac{1}{2}, \frac{1}{3}\right)$$

$$x^2 < |x+4| \longrightarrow x+4 > x^2 \quad (3)$$

$$\longrightarrow x^2 - x - 4 < 0 \longrightarrow (x-3)(x+2) < 0$$



(5)

$$\longrightarrow x+4 < -x^2 \longrightarrow x^2+x+4 < 0$$

$$\hookrightarrow \Delta = 1-16 < 0$$

$$|x-\alpha| < \beta \longrightarrow -\beta < x-\alpha < \beta \xrightarrow{+\alpha}$$

$$\alpha-\beta < x < \alpha+\beta \quad (4)$$

$$\xrightarrow{(1),(4)} \begin{cases} \alpha-\beta = -2 \\ \alpha+\beta = 3 \end{cases} \Longrightarrow 2\alpha = 1 \rightarrow \alpha = \frac{1}{2}$$

$y = |x+1| - |2x| + |x-2|$ ⇐ ۴

د

$x<-1$	$-1<x<0$	$0<x<2$	$x>2$
$-x-1+2x-x+2 = 1$	$x+1+2x-x+2 = 2x+3$	$x+1-2x-x+2 = -2x+3$	$x+1-2x+x-2 = -1$

$-1+3 = 2$ (boxed)

$y = |\frac{1}{2}x| - 2$ ⇐ ۵

د

$x<0$	$x>0$
$-\frac{1}{2}x - 2$	$\frac{1}{2}x - 2$

$\frac{1}{2}x - 2 = -\frac{1}{2}x - 2$ → $x = -3$ (boxed)

$f(x) = [\,|1-x| - |x+4|\,]$ ⇐ الف ⇐ ۶

(breakpoints: 1 and -4)

$x<-4$	$-4<x<1$	$x>1$
$1-x+x+4 = 5$	$1-x-x-4 = -2x-3$	$x-1-x-4 = -5$

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$-5 \leq |1-x| - |x+4| \leq 5$

$$\Rightarrow [|1-x| - |x+1|] =$$

$$\{-3, -2, \dots, 2, 3\}$$

$$\Rightarrow R_f = \{\pm 3, \pm 2, \pm 1, 0\}$$

$$f(x) = \frac{1}{x} - \left[\frac{x+1}{x}\right] = \frac{1}{x} - \left[\frac{1}{x}\right] + 1$$

$$t$$

$$\Rightarrow 0 < t \leq 1 \Rightarrow 1 < t+1 \leq 2 \Rightarrow R_f = (1, 2]$$

$$\Rightarrow R_f = [-1, 0)$$

$$g = [-2x] - 1 \qquad -\frac{1}{2} < x \leq 0$$

$$-1 < 2x \leq 0 \Rightarrow 1 \leq -2x < 2 \Rightarrow [-2x] \geq 1$$

$$\Rightarrow g \geq 0$$

$$-\frac{1}{2} < x \leq 0 \Rightarrow 0 \leq -2x < 1 \Rightarrow [-2x] \geq 0$$

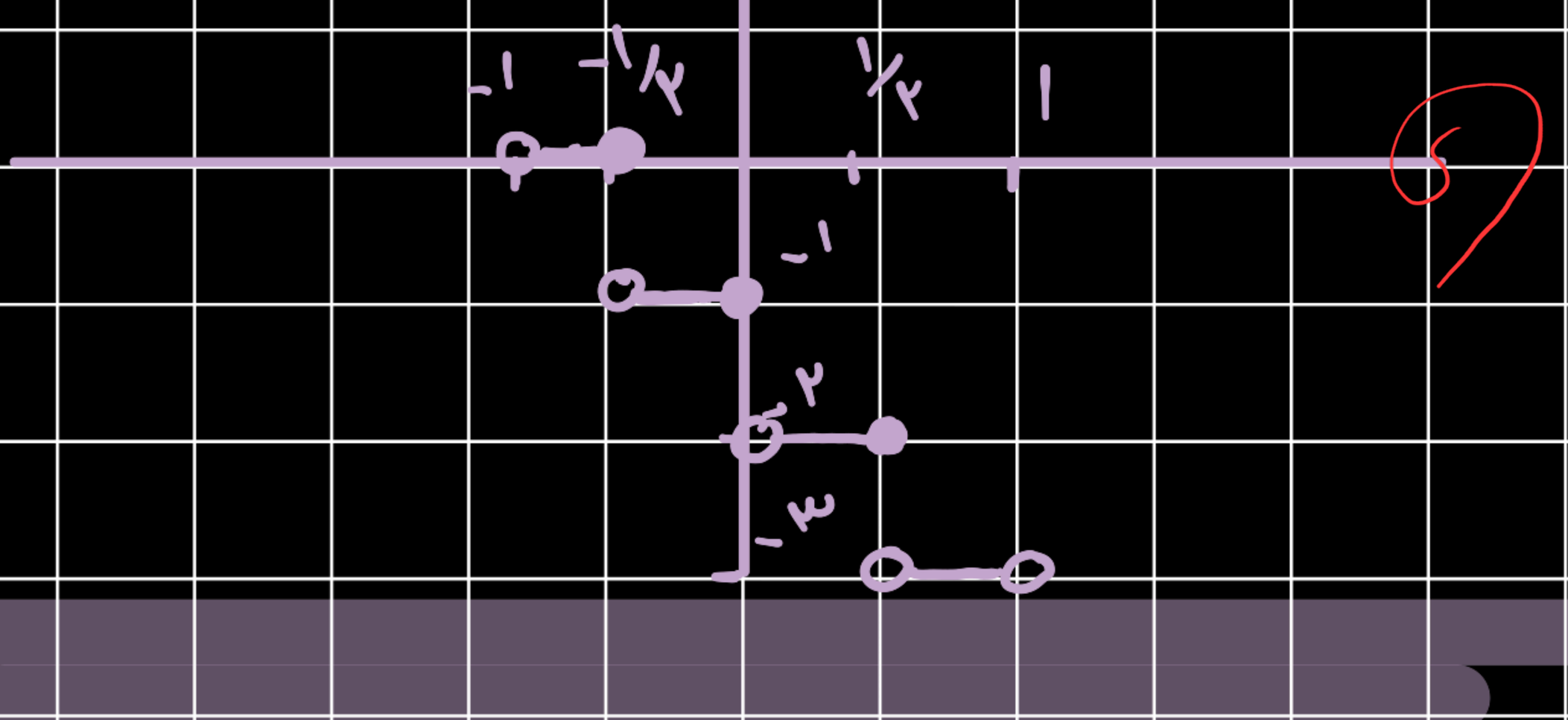
$$\Rightarrow g \geq -1$$

$$0 < x \leq \frac{1}{4} \Rightarrow -1 \leq -2x < 0 \Rightarrow [-2x] \geq -1$$

$\Rightarrow y_2 -2$

$\frac{1}{2} < x < 1 \Rightarrow -2 < -2x < -1 \rightarrow [-2x]_2 -2$

$\Rightarrow y_2 -3$



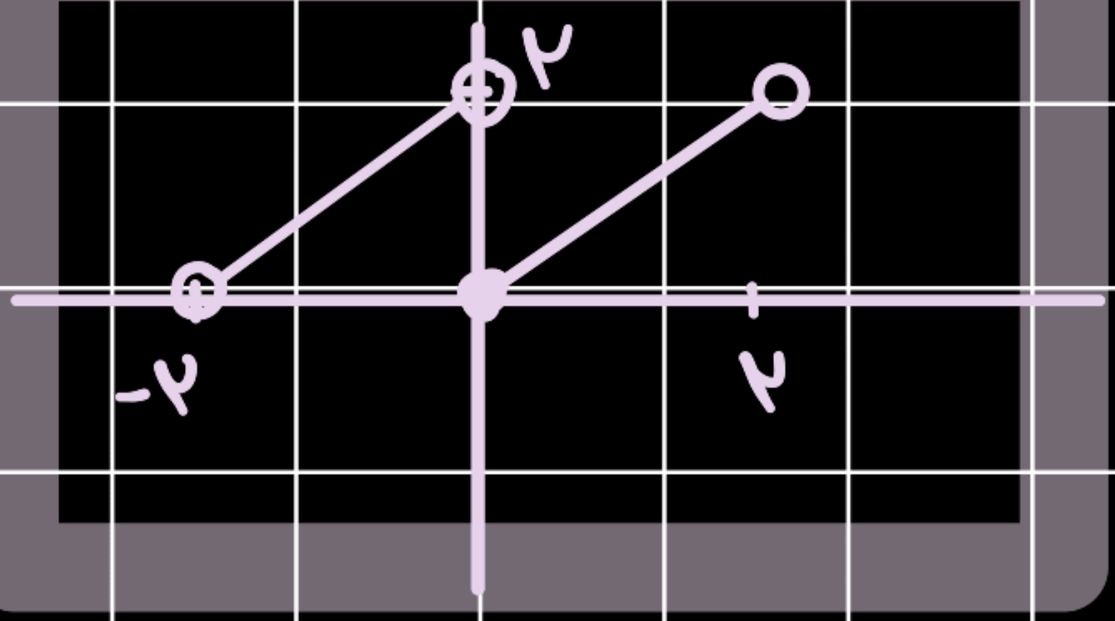
$y = x - 2[x/2]$

$-2 < x < 0 \Rightarrow -1 < x/2 < 0 \rightarrow [x/2]_2 -1$

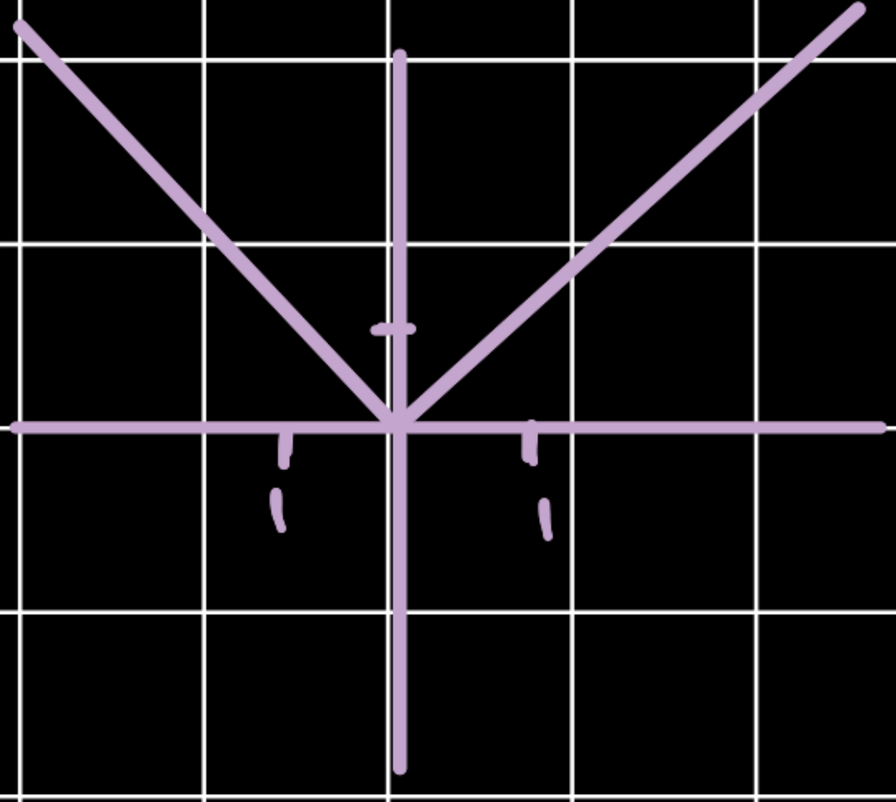
$\Rightarrow y = x + 2$

$0 \leq x < 2 \rightarrow 0 \leq x/2 < 1 \rightarrow [x/2]_2 0$

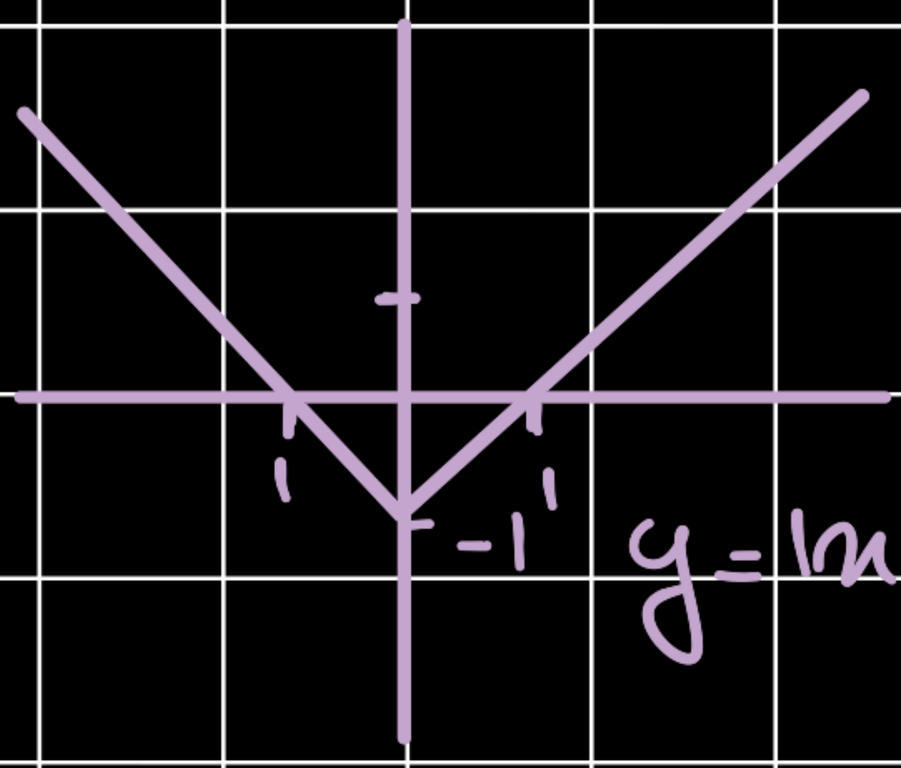
$\Rightarrow y = x$



$y = [|x| - 1|]$

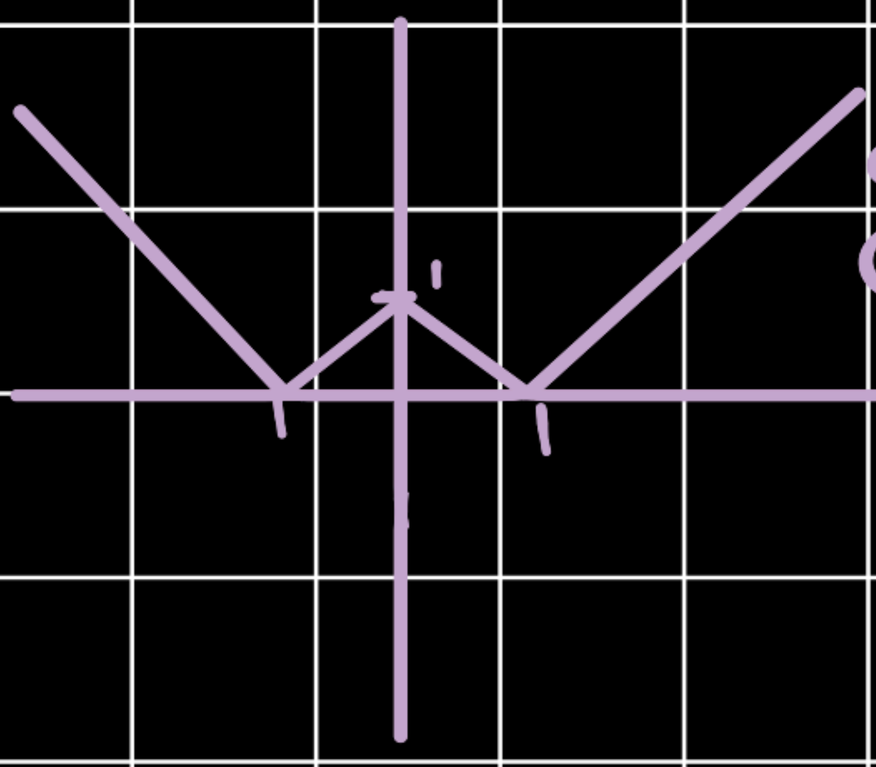


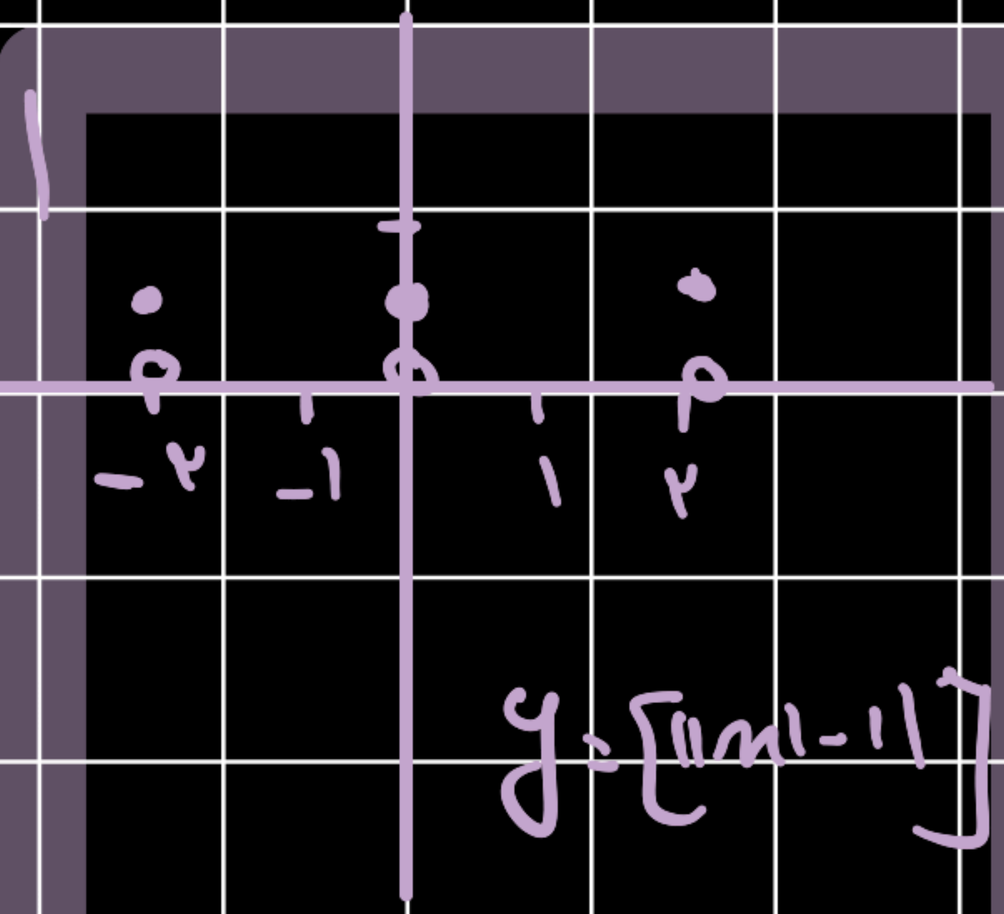
$y = |x|$



$y = |x| - 1$

$y = ||x| - 1|$





$y = [|x| - 1]$

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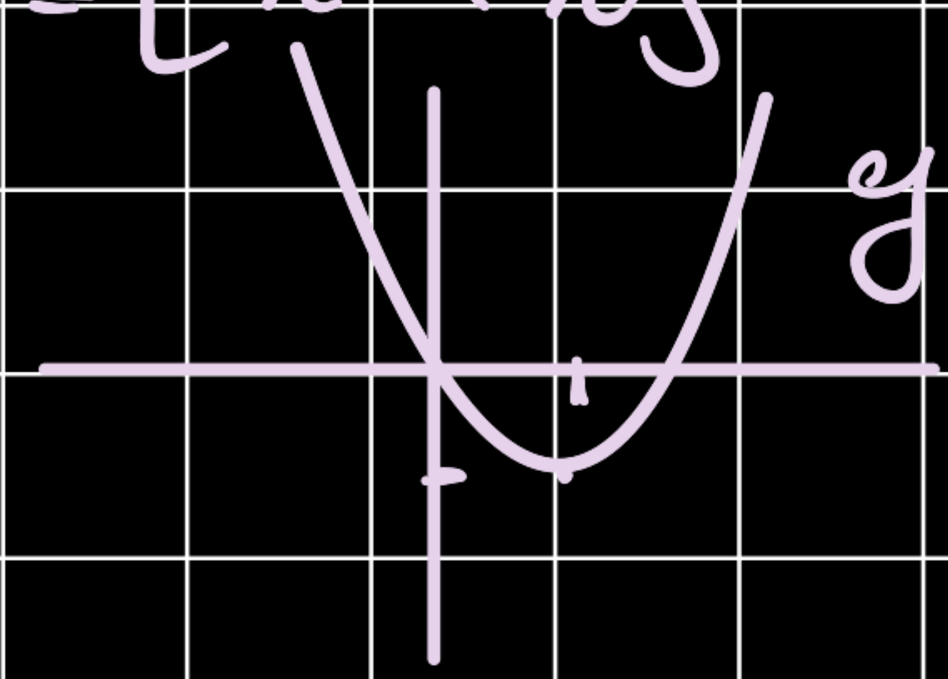
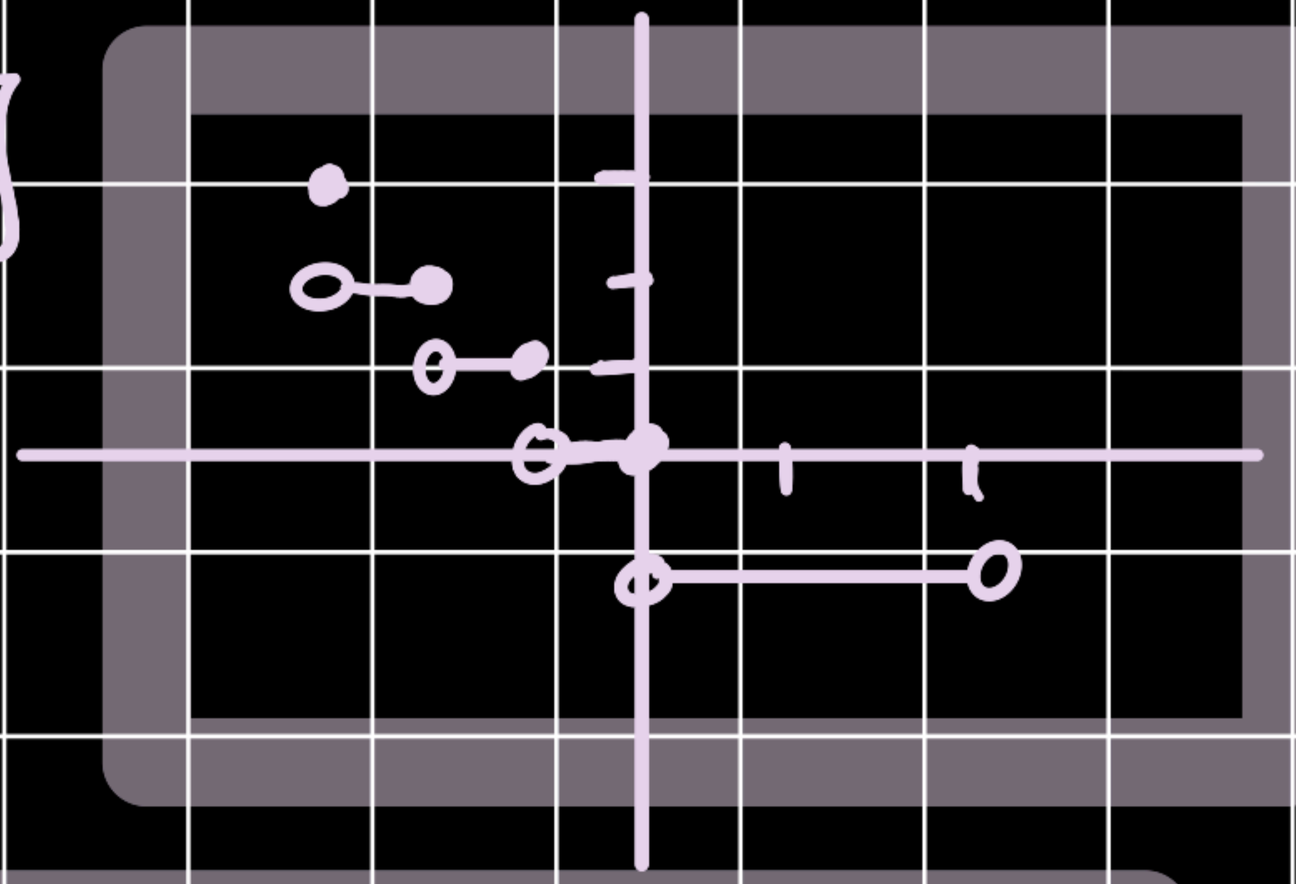
$y = [x^2 - 2x]$



$y = x^2 - 2x$

$y = [x^2 - 2x]$



$a + [b] = 2,2$

$b - [a] = 2,4$

$[a] = m \Rightarrow a = m + 0,2$

$[b] = n \Rightarrow b = n + 0,4$

$\Rightarrow m + 0,2 + n = 2,2 \Rightarrow m + n = 2$

$\Rightarrow n + 0,4 - m = 2,4 \Rightarrow n - m = 2$

$2n = 6 \Rightarrow n = 3$

$m = 1$

$b = 3,4 \; , \; a = 1,2 \Rightarrow \boxed{a + b = 4,6}$

$(۱+\sqrt{۲})^{۶}+(۱-\sqrt{۲})^{۶}=۱۹۸$ ⟵ ۱۰

$\sqrt{۲}>۱ \rightarrow ۱-\sqrt{۲}<۰$ و اعشاری مثبت $\} \rightarrow$

$(۱-\sqrt{۲})^{۶}>۰ \rightarrow$ اعشاری مثبت

$(۱+\sqrt{۲})^{۶}=۱۹۸-\underbrace{(۱-\sqrt{۲})^{۶}}_{\text{اعشار}} \Rightarrow$

$(۱+\sqrt{۲})^{۶}=۱۹۷,\ldots \Rightarrow$

$[(۱+\sqrt{۲})^{۶}]=\boxed{۱۹۷}$