

$$\frac{1}{x-1} \geq |x-1|$$

مقدار = ؟
رسمی

$$\rightarrow \frac{1}{x-1} \geq 0 \rightarrow x-1 > 0 \rightarrow x > 1$$

$$\textcircled{1} \frac{1}{x-1} \geq x-1 \xrightarrow{7-1} \frac{1}{x-1} - (x-1) \geq 0$$

$$\textcircled{2} \frac{1}{x-1} \geq 1-x \xrightarrow{2-1} \frac{1}{x-1} - (1-x) \geq 0$$

$$x=2 \quad \frac{x-1}{1-5} \quad x \geq 2$$

$$x-x^2+x^2-x$$

$$1-(x-1)^2$$

$$1+x^2-2x+x$$

$$x^2-x-1$$

$$x^2-x-1$$

$$x^2-x-1$$

$$x^2-x-1$$

$$x^2-x-1$$

$$x^2-x-1$$

$$x^2-x-1$$

$$x^2-x-1$$

$$x^2-x-1$$

$$x^2-x-1$$

$$x^2-x-1$$

$$x^2-x-1$$

$$x^2-x-1$$

$$x^2-x-1$$

$$x^2-x-1$$

$$x^2-x-1$$

$$x^2-x-1$$

$$x^2-x-1$$

$$x^2-x-1$$

$$\text{الف) } \left| \frac{2x-1}{x} \right| < 2 \rightarrow -2 < \frac{2x-1}{x} < 2$$

$$\text{ب) } \left| \frac{x-2}{2x+1} \right| > 1 \rightarrow \frac{x-2}{2x+1} > 1 \text{ or } \frac{x-2}{2x+1} < -1$$

$$x < |x+4| \rightarrow |x-\alpha| < \beta$$

$$\alpha = ? \rightarrow -x-4 < x^2 < x+4$$

$$y \geq |x+1| - |2x| + |x-2| \rightarrow$$

$$y_{\max} = ? \rightarrow 3$$

$$y_{\min} = ? \rightarrow -1$$

$$y \geq \left| \frac{1}{x} \right| - 2$$

$$\left| \frac{1}{x} \right| \geq 2 \rightarrow x \leq -\frac{1}{2} \text{ or } x \geq \frac{1}{2}$$

$$\left| \frac{1}{x} \right| \geq 2 \rightarrow x \leq -\frac{1}{2} \text{ or } x \geq \frac{1}{2}$$

$$\left| \frac{1}{x} \right| \geq 2 \rightarrow x \leq -\frac{1}{2} \text{ or } x \geq \frac{1}{2}$$

$$\left| \frac{1}{x} \right| \geq 2 \rightarrow x \leq -\frac{1}{2} \text{ or } x \geq \frac{1}{2}$$

$$\left| \frac{1}{x} \right| \geq 2 \rightarrow x \leq -\frac{1}{2} \text{ or } x \geq \frac{1}{2}$$

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

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

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

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

$$y \geq |x+1| - |2x| + |x-2| \rightarrow$$

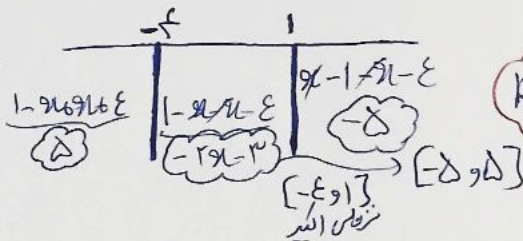
$$y_{\max} = ? \rightarrow 3$$

$$y_{\min} = ? \rightarrow -1$$

$$y \geq \left| \frac{1}{x} \right| - 2$$

$$\left| \frac{1}{x} \right| \geq 2 \rightarrow x \leq -\frac{1}{2} \text{ or } x \geq \frac{1}{2}$$

الف) $f(x) = 2[|1-x| - |x+2|]$ →
 $R_f = ?$



$R_f = \{x \mid x \in \mathbb{R}, -2 \leq x \leq 2\}$

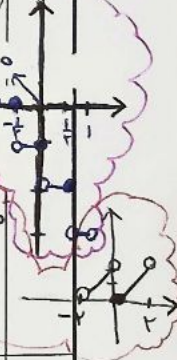
ب) $f(x) = \frac{1}{x} - \left\lfloor \frac{x+1}{x} \right\rfloor$

$R_f = \mathbb{R} \quad \frac{1}{x} - \left\lfloor 1 + \frac{1}{x} \right\rfloor \rightarrow \frac{1}{x} - \left\lfloor \frac{1}{x} \right\rfloor - 1 \quad \left\{ R_f = [-1, 0) \right\}$

الف) $y = [-2x] - 1$

$x \in (-1, 1) \rightarrow -1 < x < 1$

$\begin{aligned} -1 < x < 1 &\rightarrow -1 < -2x < 2 \\ -2 < -2x < 2 &\rightarrow -1 < x < 1 \\ -2 < -2x < 2 &\rightarrow -1 < x < 1 \end{aligned}$

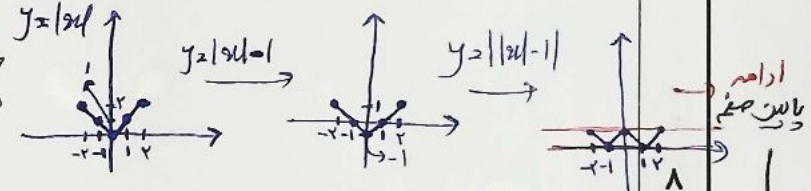


ب) $y = x - 2 \left\lfloor \frac{x}{2} \right\rfloor$ $x \in (-2, 2)$

$\begin{aligned} -2 < x < 2 &\rightarrow -1 < \frac{x}{2} < 1 \\ -1 < \frac{x}{2} < 1 &\rightarrow -2 < x < 2 \\ -1 < \frac{x}{2} < 1 &\rightarrow -2 < x < 2 \end{aligned}$

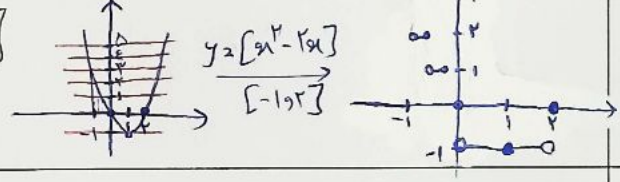
الف) $y = [|x| - 1]$

$x \in [-2, 2]$



ب) $y = [x^2 - 2x]$

$x \in [-1, 2]$



$b - [a] \in \mathbb{Z}, \varepsilon$

$[b] - [a] \in \mathbb{Z}$

$a \in [b] \in \mathbb{Z}, \varepsilon$

$[a] + [b] \in \mathbb{Z}$

$\begin{aligned} 2[b] &\geq 4 \\ [b] &\geq 2, [a] \geq 1 \\ b - [a] &\in \mathbb{Z}, \varepsilon \end{aligned}$

$a + b \in \mathbb{Z}$

$a + b \in \mathbb{Z}, \varepsilon$

$\left\{ \begin{aligned} [b] &\geq 2 \\ a + [b] &\in \mathbb{Z}, \varepsilon \rightarrow [a] \geq 1 \end{aligned} \right\}$

$(1+\sqrt{2})^7 + (-1-\sqrt{2})^7 = 198$

$\rightarrow (1+\sqrt{2})^7 = 198 - (-1-\sqrt{2})^7$

$\left\{ (1+\sqrt{2})^7 \right\} = ? \quad \rightarrow \left\{ (1+\sqrt{2})^7 \right\} = \left\{ 198 - (-1-\sqrt{2})^7 \right\}$

$+ 2198 + [- (1-\sqrt{2})^7]$

$\left\{ (1+\sqrt{2})^7 \right\} = 2198$

$\begin{aligned} 1 < \sqrt{2} < 2 &\rightarrow -2 < -\sqrt{2} < -1 \rightarrow -1 < 1-\sqrt{2} < 0 \\ 0 < (1-\sqrt{2})^7 < 1 &\rightarrow 0 < -(-1-\sqrt{2})^7 < 1 \\ &\rightarrow [(-1-\sqrt{2})^7] = -1 \end{aligned}$

