

$$\frac{1}{x-1} = |x-1| \xrightarrow{x-1=t} \frac{1}{t} = |t| \rightarrow \begin{cases} t^2 = 1 \xrightarrow{x-1>0} \\ -t^2 = 1 \quad x \end{cases} \left\{ \begin{array}{l} x-1=1 \rightarrow x=2 \quad \checkmark \\ x-1=-1 \rightarrow x=0 \quad \times \end{array} \right. \quad (x>1)$$

بله رشته دارد

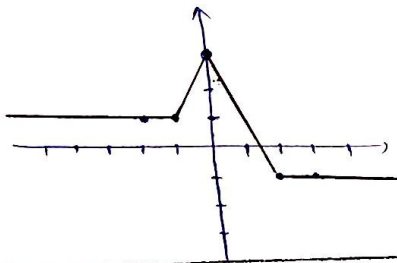
الف) $\left| \frac{x-1}{x} \right| < 2 \rightarrow -2 < \frac{x-1}{x} < 2 \rightarrow -2 < 2 - \frac{1}{x} < 2 \rightarrow -2 < -\frac{1}{x} < 0 \rightarrow 0 < \frac{1}{x} < 2$
 $\rightarrow \left\{ \begin{array}{l} 0 < \frac{1}{x} \rightarrow x > 0 \\ \frac{1}{x} < 2 \rightarrow x > \frac{1}{2} \end{array} \right\} \rightarrow \boxed{x > \frac{1}{2}}$

ب) $\left| \frac{x-2}{x+1} \right| > 1 \rightarrow \begin{cases} \frac{x-2}{x+1} > 1 \rightarrow \frac{-x-2}{x+1} > 0 \rightarrow \frac{-2}{1+} \frac{-1}{1-} \\ \frac{x-2}{x+1} < -1 \rightarrow \frac{x-1}{x+1} < 0 \rightarrow \frac{-1}{1-} \frac{1}{1+} \end{cases} \rightarrow (-2, \frac{1}{2}) - \{-\frac{1}{2}\}$

$x^2 < |x+4|$
 $\frac{-4}{x^2+x+4 < 0 \mid x^2-x-4 < 0} \rightarrow -2 < x < 2$
 $\Delta < 0 \quad \Delta < 0$
 $\frac{-2}{+1-} \frac{2}{1+}$

$\rightarrow \frac{2-2}{2} = 0.18 \quad \frac{2-(-2)}{2} = 1.8 \rightarrow |x - 0.18| < 1.8 \rightarrow \boxed{x = -0.18}$

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



$\rightarrow y_{\max} + y_{\min} = 2 + (-2) = \boxed{0}$

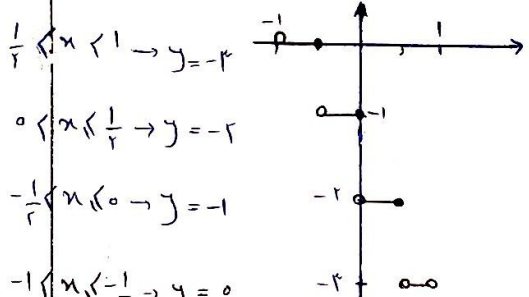
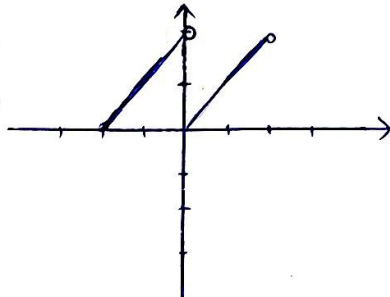
$y = \left| \frac{1}{x} \right| - 2 \rightarrow y = \left| \frac{1}{x} (x+2) \right| - 1$

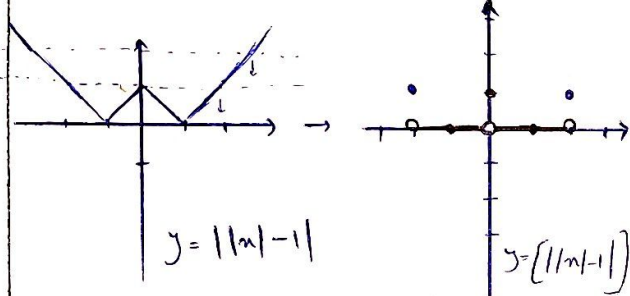
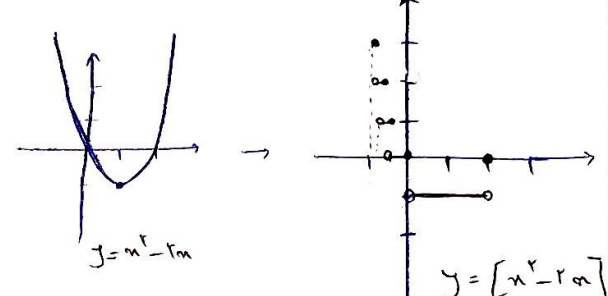
$\rightarrow \boxed{x = -2} \quad y = -\frac{1}{2}$

$\rightarrow \left| \frac{1}{x} \right| - 2 = \left| \frac{1}{x} x + 2 \right| - 1 \rightarrow \frac{-2}{-\frac{1}{x}x-2 = -\frac{1}{x}x-2} \mid \frac{0}{-\frac{1}{x}x = \frac{1}{x}x+2} \mid \frac{1}{x}x-2 = \frac{1}{x}x+1$
 $\times \rightarrow x = -2$

الف) $f(x) = [1-x] - [x+2] \rightarrow |x+(-1)| - |x+2|$  $\rightarrow R_f = \{x \in \mathbb{Z} \mid -0.5 < x < 0\}$

$\rightarrow f(x) = \frac{1}{x} - [1 + \frac{1}{x}] = \frac{1}{x} - [\frac{1}{x}] - 1 \rightarrow R_f = [-1, 0)$
 $0 < \frac{1}{x} < 1$

الف) $y = [-2x] - 1 \quad x \in (-1, 1)$  $\rightarrow y = x - 2[\frac{x}{r}] \quad x \in (-r, r)$
 $0 < x < r \rightarrow y = x$
 $-r < x < 0 \rightarrow y = x + r$ 

الف) $y = [||x| - 1|] \quad x \in [-r, r]$  $\rightarrow y = [x^2 - rx] \quad x \in [-1, r]$ 

$b - [a] = 2, 2 \rightarrow$ اعشاری، $1, 2 \leftarrow b$ $[b] - [a] = 2$
 $a + [b] = 2, 2 \rightarrow$ اعشاری، $1, 2 \leftarrow a$ $[a] + [b] = 2$

$\rightarrow [b] = 2 \rightarrow b = 2, 2$
 $\rightarrow [a] = 1 \rightarrow a = 1, 2$ $\rightarrow a + b = 2, 4$

$(1+\sqrt{2})^4 + (1-\sqrt{2})^4 = 198$ معادله درجه دوم در x بنویسیم که ریشه های آن $(1+\sqrt{2})^2$ و $(1-\sqrt{2})^2$ باشند
 $\rightarrow x^2 - 5x + 1 = 0$
 $\rightarrow x^2 - 198x + 1 = 0 \rightarrow (1+\sqrt{2})^4 = \frac{-b + \sqrt{\Delta}}{2a} = \frac{198 + \sqrt{198^2 - 2}}{2}$
 $\rightarrow 194 < \sqrt{198^2 - 2} < 198 \rightarrow \frac{198 + \sqrt{198^2 - 2}}{2} < 198 \rightarrow [(1+\sqrt{2})^4] = 194$