

۲۰ عالی نوشته!

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

این
پس رشته دارد ✓

الف) $\left| \frac{x-1}{x} \right| < 2 \rightarrow -2 < \frac{x-1}{x} < 2 \rightarrow -2 < 2 - \frac{1}{x} < 2 \rightarrow -4 < -\frac{1}{x} < 0 \rightarrow 0 < \frac{1}{x} < 4$

$$\rightarrow \left\{ \begin{array}{l} 0 < \frac{1}{x} \rightarrow x > 0 \\ \frac{1}{x} < 4 \rightarrow x > \frac{1}{4} \end{array} \right\} \rightarrow \boxed{x > \frac{1}{4}} \checkmark$$

ب) $\left| \frac{x-2}{x+1} \right| > 1 \rightarrow \begin{cases} \frac{x-2}{x+1} > 1 \rightarrow \frac{-x-2}{x+1} > 0 \rightarrow \frac{-2}{1+} \frac{-1}{1-} \\ \frac{x-2}{x+1} < -1 \rightarrow \frac{x-1}{x+1} < 0 \rightarrow \frac{-1}{1-} \frac{1}{1+} \end{cases} \rightarrow (-2, \frac{1}{3}) - \{-\frac{1}{3}\}$

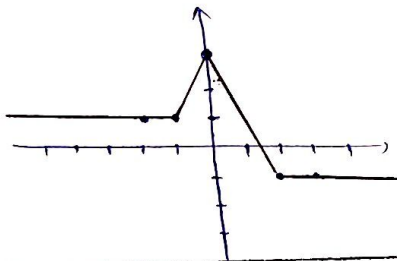
$$x^2 < |x+4|$$

$$\begin{array}{c} -4 \\ \hline x^2 + x + 4 < 0 \quad | \quad x^2 - x - 4 < 0 \end{array} \rightarrow -2 < x < 2$$

ا) $\Delta < 0$ $\Delta < 0$ $\frac{-2}{+1-} \frac{2}{1+}$

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

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



$$\rightarrow y_{\max} + y_{\min} = 1 + (-1) = \boxed{0} \checkmark$$

$$y = \left| \frac{1}{x} \right| - 2 \rightarrow y = \left| \frac{1}{x} (x+4) \right| - 1$$

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

$$\rightarrow \left| \frac{1}{x} \right| - 2 = \left| \frac{1}{x} x + 4 \right| - 1 \rightarrow \begin{array}{c} -2 \quad 0 \\ \hline -\frac{1}{x} x - 2 = -\frac{1}{x} x - 2 \quad | \quad -\frac{1}{x} x = \frac{1}{x} x + 4 \quad | \quad \frac{1}{x} x - 2 = \frac{1}{x} x + 1 \end{array}$$

$\times \quad \rightarrow x = -2$

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

ب) $f(x) = \frac{1}{x} - [1 + \frac{1}{x}] = \frac{1}{x} - [\frac{1}{x}] - 1 \rightarrow R_f = [-1, 0)$ (2)

الف) $y = [-2x] - 1 \quad x \in (-1, 1)$ (2)

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

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

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

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

ب) $y = x - 2[\frac{x}{2}] \quad x \in (-2, 2)$

$0 < x < 2 \rightarrow y = x$

$-2 < x < 0 \rightarrow y = x + 2$

الف) $y = [||x| - 1|] \quad x \in [-2, 2]$ (2)

ب) $y = [x^2 - 2x] \quad x \in [-1, 2]$

$b - [a] = 2, 2 \rightarrow$ اعتمادی [b] - [a] = 2

$a + [b] = 2, 2 \rightarrow$ اعتمادی [a] + [b] = 2

$\rightarrow [b] = 2 \rightarrow b = 2, 2$

$\rightarrow [a] = 1 \rightarrow a = 1, 2$

$\rightarrow a + b = 2, 4$

$(1 + \sqrt{2})^4 + (1 - \sqrt{2})^4 = 198$ (2)

$x^2 - 5x + 1 = 0$

$x^2 - 198x + 1 = 0 \rightarrow (1 + \sqrt{2})^4 = \frac{-b + \sqrt{\Delta}}{2a} = \frac{198 + \sqrt{198^2 - 4}}{2}$

$194 < \sqrt{198^2 - 4} < 198 \rightarrow \frac{198 + \sqrt{198^2 - 4}}{2} < 198 \rightarrow [(1 + \sqrt{2})^4] = 194$