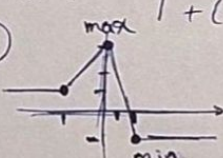


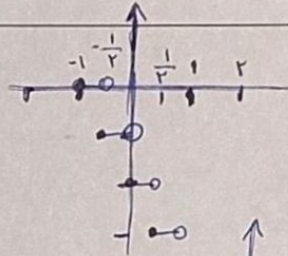
مسئله فقط یک جواب دارد. $\frac{1}{x-1} = x-1 $ $\rightarrow \frac{1}{x-1} = x-1 \quad \frac{1-x^2+x}{x-1} = -1 \quad x^2-2x=0 \quad x(x-2)=0 \quad \boxed{x=0} \quad \boxed{x=2}$ $\rightarrow \frac{1}{x-1} = -x+1 \quad \frac{1+x^2-x}{x-1} = 1 \quad x^2+2x+2=0 \quad \Delta = (-2)^2 - 4 \times 1 \times 2 = -4 \quad \Delta < 0$	الف) $\left \frac{2x-1}{x} \right < 2 \quad -2 < \frac{2x-1}{x} < 2 \rightarrow -2 < \frac{2x-1}{x} < 2 \quad x > \frac{1}{2}$ $\rightarrow \frac{2x-1}{x} < 2 \quad 1 > 0 \quad \rightarrow \left(\frac{1}{2}, +\infty \right)$ ب) $\left \frac{x-2}{2x+1} \right > 1 \rightarrow \textcircled{1} \frac{x-2}{2x+1} > 1 \quad x < -3$ $\rightarrow \textcircled{2} \frac{x-2}{2x+1} < -1 \quad 3x < 1 \quad x < \frac{1}{3}$ $\rightarrow \frac{x-2}{2x+1} > 1 \quad x < -3$ $\rightarrow \frac{x-2}{2x+1} < -1 \quad x < \frac{1}{3}$	$x+y > x^2 \rightarrow x+y > x^2 \quad x^2-x-y < 0 \quad \frac{-2}{-2} \quad \frac{3}{-2} \quad (-2, 3)$ $\rightarrow x+y < -x^2 \quad x^2+x+y < 0 \quad \Delta < 0 \quad X$ $x-\alpha < \beta \quad -\beta < x-\alpha < \beta \quad \alpha-\beta < x < \alpha+\beta \quad (-2, 3) \quad \alpha-\beta = -2 \quad \alpha+\beta = 3$ $\begin{cases} \alpha-\beta = -2 \\ \alpha+\beta = 3 \end{cases} \rightarrow 2\alpha = 1 \quad \boxed{\alpha = \frac{1}{2}} \quad \boxed{\beta = \frac{5}{2}} \quad \left x - \frac{1}{2} \right < \frac{5}{2}$	$x+1 - 2x + x-2$ $-1 \quad 0 \quad 2$ $-x-1+2x-x+2 \quad x+1+2x-x+2 \quad x+1-2x-x+2 \quad x+1-2x+x-2$ $\textcircled{1} \quad 2x+3 \quad -2x+3 \quad \textcircled{-1}$ max min $3 + (-1) = 2$ 	$y = \left \frac{1}{2}x \right - 2 \xrightarrow{\text{تأخیر}} \left \frac{x+4}{2} \right - 2 \xrightarrow{\text{بالاتر}} \left \frac{x+4}{2} \right - 1$ متناهی $\rightarrow \left \frac{1}{2}x \right - 2 = \left \frac{x+4}{2} \right - 1 \quad \left \frac{1}{2}x \right - 1 = \left \frac{x+4}{2} \right$ $\rightarrow \frac{x}{2} - 1 = \frac{x}{2} + 2 \quad -1 \neq 2$ $\rightarrow \frac{x}{2} + 1 = -\frac{x}{2} + 2 \quad \frac{2x}{2} + 1 = 2 \quad \boxed{x = -3}$
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الف) $f(x) = [1-x] - [x+1] \rightarrow$ درستی $x=1 \rightarrow |1-1| - |1+1| = -2$
 $x=-1 \rightarrow |1+1| - |-1+1| = 2$

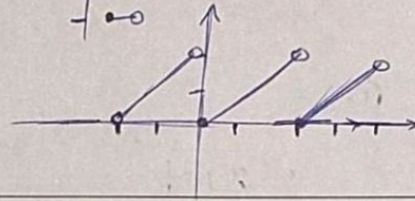
$[-\infty, \infty] \xrightarrow{\text{برگشت}} [-\infty, -4, -3, -2, -1, 0, 1, 2, 3, 4, \infty]$

ب) $f(x) = \frac{1}{x} - \left[\frac{x+1}{x} \right] \rightarrow \frac{1}{x} - \left[1 + \frac{1}{x} \right] \rightarrow \frac{1}{x} - \left[\frac{1}{x} \right] - 1$
 $\left[\frac{1}{x} \right] + 1$ $\frac{1}{x} = +$
 $+ - [+] \rightarrow 0 \leq + - [+] < 1$ $\rightarrow [-1, 0)$

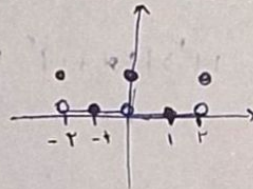
الف) $y = [-2x] - 1 \quad x \in (-1, 1)$



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

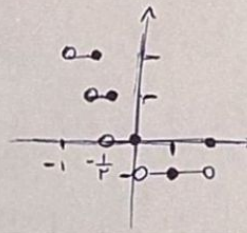


الف) $y = [11x - 11] \quad x \in [-2, 2]$



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

$x(x-2) \rightarrow x=0$
 $\rightarrow x=2$



$a + [b] = 4, 2$

نسبت اعشاری $\rightarrow a = 0, 2, [a] + [b] = 4$

$\begin{cases} [a] + [b] = 4 \\ [b] - [a] = 2 \end{cases} \rightarrow \begin{cases} [a] = 1 \\ [b] = 3 \end{cases}$

$b - [a] = 2, 4$

نسبت اعشاری $\rightarrow b = 2, 4, [b] - [a] = 2$

$\rightarrow a + b = 0, 2 + 2, 4 = [2, 4]$

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

$(1+\sqrt{2})^4 + (1-\sqrt{2})^4 = 191 \quad (1+\sqrt{2})^4 = 191 - (1-\sqrt{2})^4$

$0 < (1-\sqrt{2})^4 < 1$

$\rightarrow 191 < (1+\sqrt{2})^4 < 192 \Rightarrow \boxed{191}$