

$$|x-1| = \frac{1}{x-1} \rightarrow x-1 = \frac{1}{x-1} \rightarrow (x-1)^2 = 1 \Rightarrow x^2 - 2x = 0$$

$$x-1 = \frac{1}{1-x} \quad \begin{matrix} x=0 \\ x=2 \end{matrix}$$

$$-(x-1)^2 = 1 \rightarrow -x^2 + 2x - 1 = 0 \rightarrow \Delta < 0$$

(۲ ریشه)

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

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

جواب $\rightarrow x = (\frac{1}{4}, +\infty)$

ب) $\left| \frac{x-2}{2x+1} \right| > 1 \quad \begin{matrix} \frac{x-2}{2x+1} > 1 \rightarrow \frac{x-2-2x-1}{2x+1} > 0 \Rightarrow \frac{-x-3}{2x+1} > 0 \quad \frac{-\frac{1}{2}}{+\frac{1}{2}} - \frac{3}{+} \\ \frac{x-2}{2x+1} < -1 \rightarrow \frac{x-2+2x+1}{2x+1} < 0 \Rightarrow \frac{3x-1}{2x+1} < 0 \quad \frac{-\frac{1}{3}}{+} - \frac{1}{+} \end{matrix}$

جواب $\rightarrow \emptyset$

$$x^2 < |x+4| \rightarrow x^2 < x+4 \rightarrow x^2 - x - 4 < 0 \rightarrow (x-3)(x+1) < 0 \quad \frac{-2}{+} \frac{4}{-} \frac{3}{+}$$

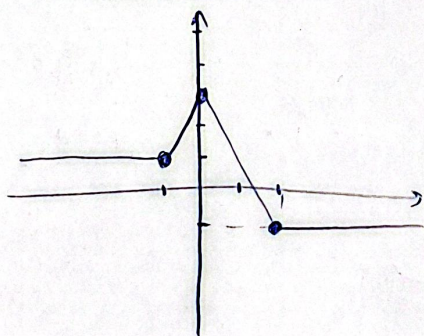
$$-x^2 > x+4 \rightarrow x^2 + x + 4 < 0 \rightarrow \Delta < 0 \quad a > 0$$

$x \in (-2, 3) \quad |x-a| < B \rightarrow -B < x-a < B \rightarrow x-B < x < x+B$

$\Rightarrow \begin{matrix} a+B=3 \\ a-B=-2 \end{matrix} \rightarrow 2a=1 \rightarrow a=\frac{1}{2}$

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

$$y = \begin{cases} 1 & x < -1 \\ 2x+3 & -1 \leq x < 0 \\ -2x+3 & 0 \leq x < 2 \\ -1 & 2 \leq x \end{cases}$$



max $\rightarrow 3$
min $\rightarrow -1$

$3+(-1)=2$

$f(x) = \left| \frac{1}{2}x \right| - 2$

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

تقارن $\rightarrow \left(\frac{1}{2}x + 2 \right)^2 = \left(\frac{1}{2}x - 1 \right)^2 \rightarrow x = -1$ (مقدار منفی)

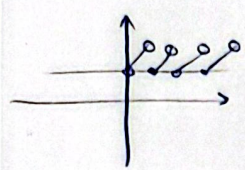
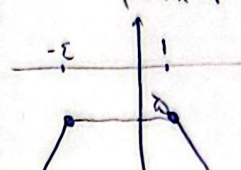
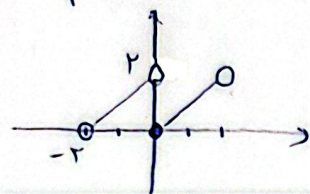
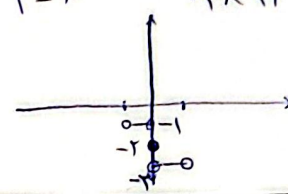
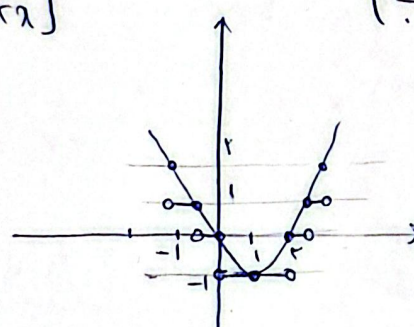
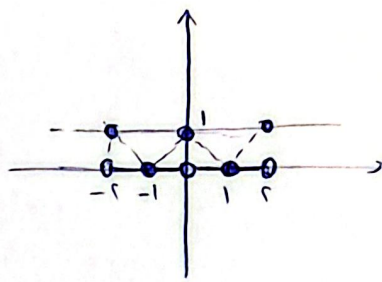
ب) $\left(\frac{1}{2}x + 2 \right)^2 = \left(-\frac{1}{2}x - 1 \right)^2 \rightarrow x = -3$ (دست)

$1/2 - 2 = -3/2$

$\frac{1}{2}$

$\frac{1}{2}x^2 + 2 + 2x = \frac{1}{2}x^2 + 1 - x \rightarrow 2x + 1 = -x \rightarrow 3x = -1 \rightarrow x = -1/3$

$\frac{1}{2}x^2 + 2 + 2x = \frac{1}{2}x^2 + 1 + x \rightarrow 2x + 1 = 1 + x \rightarrow x = 0$

$f(x) = \frac{1}{x} - \left[\frac{x+1}{x} \right] = \frac{1}{x} - \left[\frac{1}{x} \right] + 1$ (ب) ۱. بد این تابع $[0, 1]$ است.  $R_f = [1, 2)$	$f(x) = [1-x] - [x+2]$ (الف) $f(x) = \begin{cases} 2x+2 & x < -2 \\ -5 & -2 \leq x < 1 \\ -2x-2 & 1 \leq x \end{cases}$  $R_f = \{y \mid y \in \mathbb{Z}, y \leq -5\}$	۶	
$y = x - 2 \left[\frac{x}{2} \right]$ (ب) $y = \begin{cases} x+2 & -2 \leq x < 0 \\ x & 0 \leq x < 2 \end{cases}$ 	$y = [-2x] - 1$ (الف) $y = \begin{cases} -1 & -1 < x < 0 \\ -2 & x = 0 \\ -x & 0 < x < 1 \end{cases}$ 	۷	
$y = [x^2 - 2x]$ (ب) 	$y = [x - 1]$ (الف) 	۸	
$a + [b] = 4, 2 \quad \xrightarrow{\text{از طرف خطا}} \quad \left. \begin{matrix} [b] = 3 \\ a = 1, 2 \end{matrix} \right\}$ $b - [a] = 2, 5 \quad \xleftarrow{\text{امتحان کردن}}$ اگر $a = 1, 2 \rightarrow [a] = 1 \quad b - [a] = 2, 5 \rightarrow b - 1 = 2, 5 \Rightarrow b = 3, 6$ $\left. \begin{matrix} a = 1, 2 \\ b = 3, 6 \end{matrix} \right\} \rightarrow (a+b = 4, 4) \quad [b] = 3$ (پس) درسته			۹
$(1+\sqrt{2})^4 + (1-\sqrt{2})^4 = 148$ $\xrightarrow{\quad} 1-\sqrt{2} \approx 1-1,4 = -0,4 \rightarrow (-0,4)^4 \rightarrow 1$ بین ۰ و ۱ $[(1-\sqrt{2})^4] = 0$ $[(1+\sqrt{2})^4] \rightarrow 148 - (1-\sqrt{2})^4 = 147, \dots = (1+\sqrt{2})^4$ $\xrightarrow{\text{بین ۰ و ۱}} \Rightarrow [(1+\sqrt{2})^4] = 147$			۱۰