

(1)

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$$\rightarrow y=1 \quad -1 < x \leq 0 \rightarrow y = x+1 + 1 - x + 1 \rightarrow y = 1 + 1 \quad / \quad x = -1 \rightarrow y = 1$$

$$0 < x < 1 \quad y = x+1 - 2x - x+1 \rightarrow y = -2x+2 \begin{cases} x=0 \rightarrow y=2 \\ x=1 \rightarrow y=0 \end{cases}$$

$$x > 1 \rightarrow y = x+1 - 2x - x+1 \rightarrow y = -1 \quad \Rightarrow \begin{matrix} \text{بالا} \rightarrow 2 \\ \text{پایین} \rightarrow -1 \end{matrix} \Rightarrow 2 + (-1) = 1$$

$$y = \frac{1}{x} |x| - 1 \rightarrow y = \frac{1}{x} |x+1| - 1 \Rightarrow \frac{1}{x} |x| - 1 = \frac{1}{x} |x+1| - 1 \xrightarrow{\times x} |x| - 1 = |x+1| - 1$$

$$\rightarrow |x| - 1 = |x+1| - 1 \begin{cases} x \geq 0 \rightarrow x = x+1 \text{ غیر ممکن} \\ -1 < x < 0 \rightarrow -x = x+1 \rightarrow x = -1 \\ x < -1 \rightarrow -x = -x-1 \text{ غیر ممکن} \end{cases}$$

$$f(x) = [|x| - |x+1|] \begin{cases} x \leq -1 \rightarrow 1 - x + x + 1 = 2 \\ -1 < x < 0 \rightarrow 1 - x - x - 1 = -2x \\ x > 0 \rightarrow x - 1 - x - 1 = -2 \end{cases}$$

$$-2 \leq |x| - |x+1| \leq 2 \rightarrow [-2, 2] \Rightarrow \{-2, -1, 0, 1, 2\}$$

$$b) \frac{x+1}{x} = 1 + \frac{1}{x} \Rightarrow y = \frac{1}{x} - [1 + \frac{1}{x}]$$

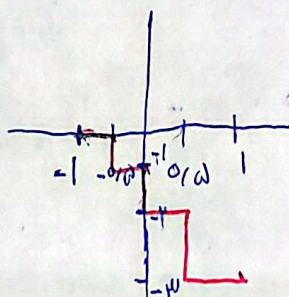
$$y = \frac{1}{x} - (1 + [\frac{1}{x}])$$

$$[0, 1) \rightarrow 0 < \frac{1}{x} < 1 \rightarrow -1 < \frac{1}{x} - 1 < 0$$

$$\Rightarrow R = [-1, 0)$$

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

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

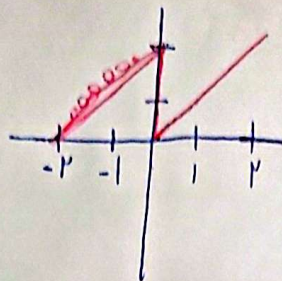


ب) $x - 2 \left[\frac{x}{2} \right], x \in (-2, 2)$

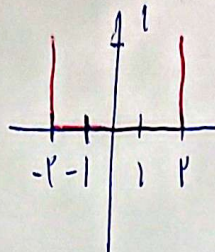
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$$y = \begin{cases} x+2 & -2 < x < 0 \rightarrow -1 \\ x & 0 \leq x < 2 \rightarrow 0 \end{cases}$$

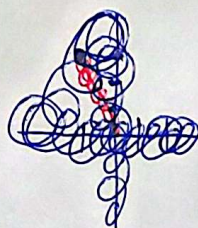
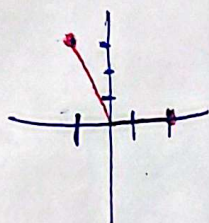


الف) $[||x|-1|], x \in [-2, 2]$



(1)

ب) $[x^2 - 2x], x \in [-1, 2]$



$a+[b] = f, g, b-[a] = 2, f$

$a+b = ? \quad [a] = m, [b] = n \quad a = f, g-h, b = 2, f+m \quad m \leq f, g-h < m+1$

$b = 2, f+m$

$m+n = f \leftarrow m+h \leq f, g < m+n+1$

$h \leq 2, f+m < n+1 \rightarrow n-m \leq 2, f < n-m+1 \rightarrow n-m = 2 \quad \begin{cases} h+m = f \\ n-m = 2 \end{cases} \rightarrow n = 2, m = 1$

$\rightarrow a = f, g-h = 1, 2, b = 2, f \Rightarrow a+b = 2, 2, f = f, g$

(9)

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

(10)

$0 < (1-\sqrt{2})^4 < 1 \quad [(1+\sqrt{2})^4] + [(1-\sqrt{2})^4] = [(1+\sqrt{2})^4] + 0$

$[(1+\sqrt{2})^4] = 198 - 1 \rightarrow [(1+\sqrt{2})^4] = 197$