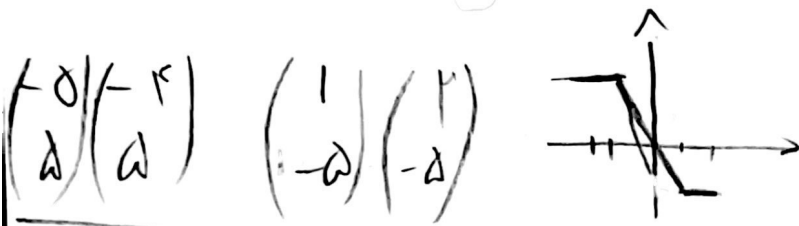


سوال 4) بر روی صفحه مختصات زیر

$$f(x) = \overbrace{[|1-x| - |x+1|]}^{g(x)} \Rightarrow R_g(x) = [-5, 5]$$



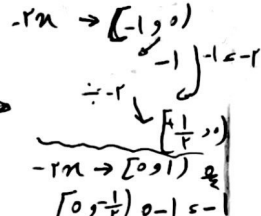
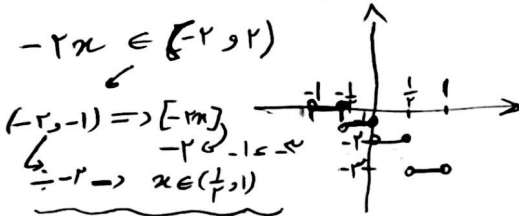
$$R_f(x) = \{-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$$

$$1) \frac{1}{n} - \left[\frac{n+1}{n} \right]$$

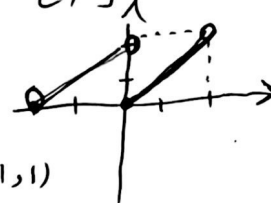
$$[0, 1)$$

$$\frac{1}{n} - \left[1 + \frac{1}{n} \right] \Rightarrow \frac{1}{n} - \left[\frac{1}{n} \right] - 1 \Rightarrow R = [-1, 0)$$

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



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

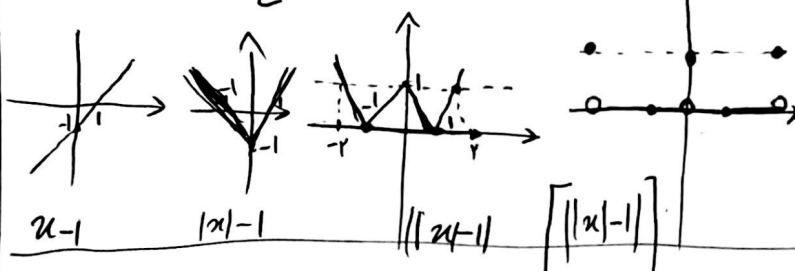


$$\frac{x}{2} \in (-1, 1)$$

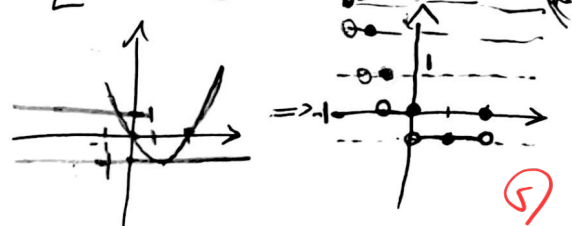
$$\frac{x}{2} \rightarrow (-1, 0) \rightarrow \left[\frac{x}{2} \right] = -1 \Rightarrow x + 2$$

$$[0, 2) \rightarrow \left[\frac{x}{2} \right] = 0 \Rightarrow y = x$$

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



$$ب) [x^2 - 2x] \quad x \in [-1, 2]$$



$$P_a = 0/2 \quad P_b = 0/4 \quad b - [a] = 2/4 \Rightarrow b - a + \frac{1}{10} = 2/4$$

$$a = 1/2, b = 3/4 \quad a + [b] = 4/2 \Rightarrow a + b - 0/4 = 4/2 \Rightarrow a + b = 4/4$$

$$(1 + \sqrt{2})^4 + (1 - \sqrt{2})^4 = 19 \wedge [(1 + \sqrt{2})^4] = ?$$

$$-1 < 1 - \sqrt{2} < 0 \Rightarrow (1 - \sqrt{2})^4 < 1 \Rightarrow 19 \wedge (1 - \sqrt{2})^4 = 19 \wedge \frac{1}{m}$$

$$(19 \wedge) \leftarrow [19 \wedge \frac{1}{m}]$$

$$n-1=t$$

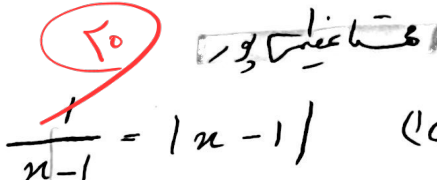
$$\frac{1}{t} = |t|$$

$$t \neq 0$$

$$\Rightarrow$$

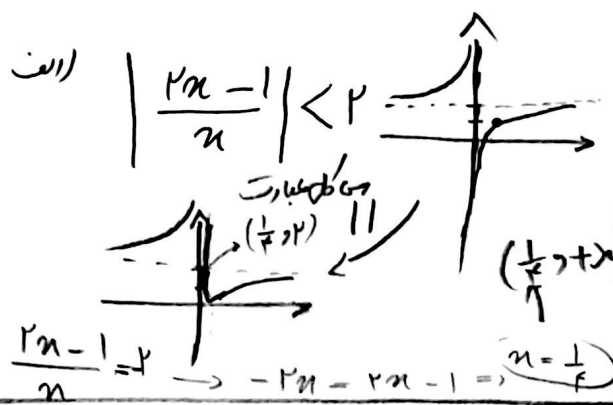
$$t/|t| = 1 \Rightarrow t = 1 \Rightarrow$$

$$n-1=1 \Rightarrow n=2$$



$$\frac{1}{n-1} = |n-1|$$

$$n=2$$



$$\left| \frac{n-1}{n+1} \right| > 1$$

$$\frac{n-1}{n+1} > 1 \Rightarrow -\frac{n-1}{n+1} < -1$$

$$\frac{n-1}{n+1} < -1 \Rightarrow \frac{n-1}{n+1} < -1$$

$$I \cup II \rightarrow (-\infty, -\frac{1}{2}) \cup (-\frac{1}{2}, \frac{1}{2})$$

$$|x-a| \leq B \leftarrow x^r < |x+4|$$

$$x^r < |x+4| \rightarrow x > -4 \Rightarrow x^r - x - 4 < 0 \Rightarrow + \left| - \right| + (-2, 3)$$

$$x < -4 \Rightarrow x^r + x + 4 < 0 \Rightarrow \Delta < 0 \text{ and } a > 0 \Rightarrow \text{no solution}$$

$$\Rightarrow (-2, 3) \rightarrow \frac{-r+r}{r} = \frac{1}{r} \Rightarrow \left| x - \frac{1}{r} \right| < \frac{1}{r} \quad \boxed{a = \frac{1}{r}}$$

$$y = |x+1| - |2x| + |x-2| \quad \begin{pmatrix} -1 \\ 1 \end{pmatrix} \begin{pmatrix} -1 \\ 1 \end{pmatrix} \begin{pmatrix} 0 \\ 2 \end{pmatrix} \begin{pmatrix} 1 \\ -1 \end{pmatrix} \begin{pmatrix} 2 \\ -1 \end{pmatrix} \quad (15 \text{ Sol})$$

$$x \geq 2 \rightarrow y = -1$$

$$0 < x < 2 \rightarrow x+1-2x-x+2 \Rightarrow -2x+3 \Rightarrow [-1, 3]$$

$$-1 \leq x < 0 \rightarrow x+1+2x-x+2 \Rightarrow 2x+3 \Rightarrow [-1, 3]$$

$$x < -1 \rightarrow 1-x+2x-x+2 \Rightarrow 3$$

$$\min = -1 \quad \max = 3$$

$$x-1 = 0$$

$$\left| \frac{1}{r}(x+r) \right| - 1 = \left| \frac{1}{r}x \right| - r \Rightarrow |x+r| - r = |x| - r$$

$$|x+r| - |x| = -r \Rightarrow x = -r$$

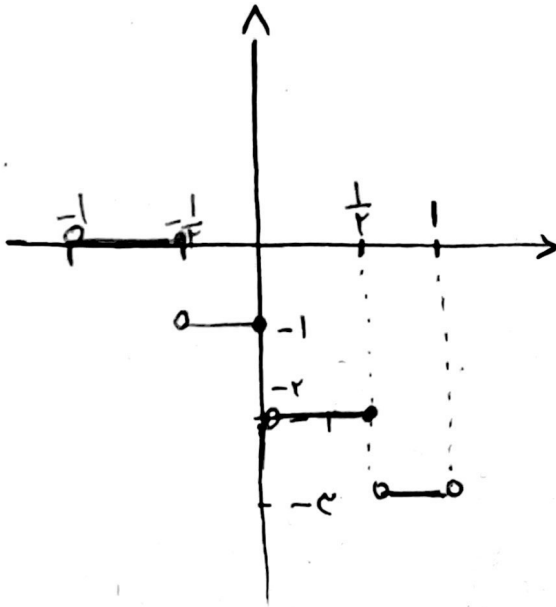


$$\begin{pmatrix} -\omega \\ -r \end{pmatrix} \begin{pmatrix} -r \\ -r \end{pmatrix} \begin{pmatrix} 0 \\ r \end{pmatrix} \begin{pmatrix} 1 \\ r \end{pmatrix} \quad 2x+r = -r \Rightarrow x = -r$$

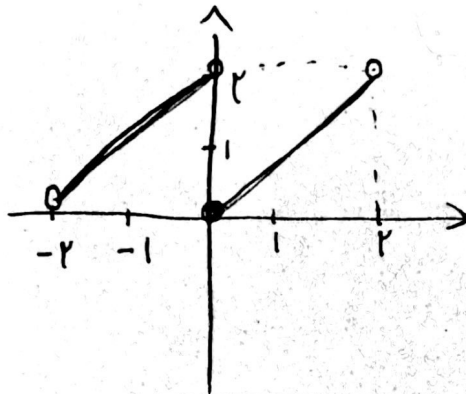
(5)

سوال ۷ (حل مختصر و مفاد)

الف

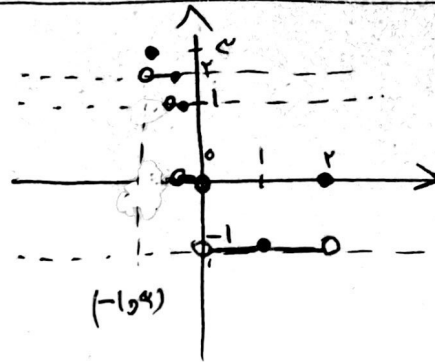


ب



سوال ۸

الف



ب

