

$$x > 1 \rightarrow \frac{1}{x-1} = x-1 \Rightarrow x^2 - 2x + 1 = 1 \Rightarrow x = 0, x = 2 \quad \text{①}$$

$$x < 1 \rightarrow \frac{1}{x-1} = 1-x \Rightarrow x^2 - 2x + 1 = 0 \Rightarrow \Delta < 0$$

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

$$\frac{2x-1+2x}{x} > 0 \rightarrow \frac{4x-1}{x} > 0 \rightarrow x \in \left(\frac{1}{4}, \infty \right) \quad \text{③}$$

$$\text{ب) } \left| \frac{x-2}{2x+1} \right| < 1 \rightarrow \frac{x-2}{2x+1} < 1 \rightarrow \frac{-x-3}{2x+1} > 0 \rightarrow \frac{-x-3}{2x+1} > 0$$

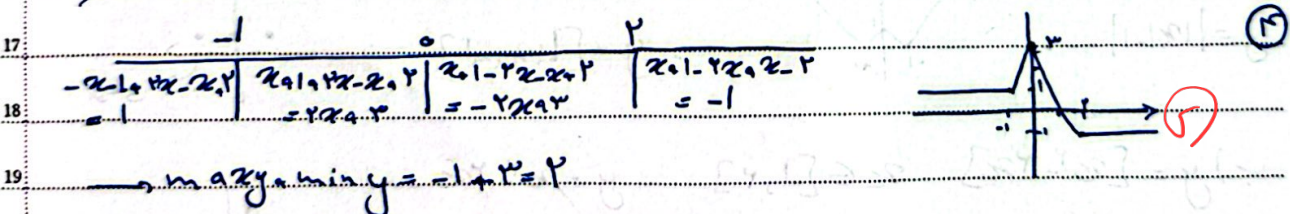
$$\frac{x-2}{2x+1} < -1 \rightarrow \frac{3x-1}{2x+1} < 0 \rightarrow \frac{-\frac{1}{3}}{-\frac{1}{2} + \frac{1}{2}} \rightarrow x \in \left(-\frac{1}{3}, -\frac{1}{2} \right) \cup \left(-\frac{1}{2}, \frac{1}{2} \right)$$

$$x^2 < |x+4| \rightarrow x^2 - x - 4 < 0 \rightarrow \frac{-x \pm \sqrt{x^2 + 16}}{2} > 0$$

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

$$|x-\alpha| < \beta \rightarrow -\beta < x-\alpha < \beta \rightarrow \beta+\alpha < x < \beta+\alpha$$

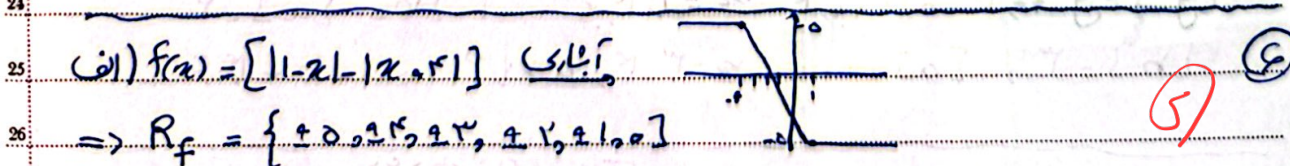
$$-2 < x < 2 \rightarrow \begin{cases} \alpha+\beta=2 \\ \alpha-\beta=-2 \end{cases} \rightarrow \alpha = \frac{1}{2}, \beta = \frac{3}{2}$$



$$y' = \left| \frac{1}{x} \right| - 1 = y \quad \left| \frac{1}{x} \right| - 1 = \left| \frac{1}{x} \right| - 1$$

$$\hookrightarrow x = 1 \quad \hookrightarrow x = -1$$

$$|x+4| - |x| = -2 \rightarrow x = -3$$



Arman

$$b) f(x) = \frac{1}{x} - \left[\frac{x+1}{x} \right] = \frac{1}{x} - \left[1 + \frac{1}{x} \right] = \frac{1}{x} - 1 - \left[\frac{1}{x} \right]$$

$$0 < \frac{1}{x} - \left[\frac{1}{x} \right] < 1 \rightarrow -1 < \frac{1}{x} - \left[\frac{1}{x} \right] - 1 < 0 \rightarrow R = (-1, 0)$$

$$a) y = [-2x] - 1, x \in (-1, 1) \rightarrow 2x \in (-2, 2)$$

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

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

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

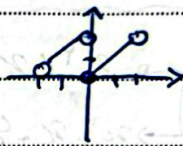
$$\frac{1}{2} < x < 1 \rightarrow y = -3$$



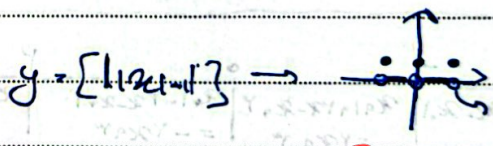
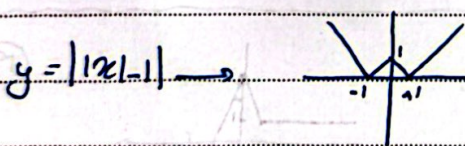
$$b) y = x - 2 \left[\frac{x}{2} \right], x \in (-2, 2)$$

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

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

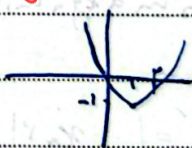
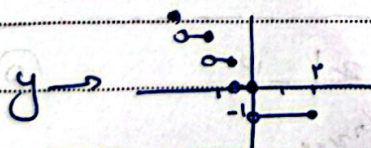


$$a) y = [1|x| + 1], x \in [-2, 2]$$



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

$$y = x^2 - 2x$$



$$a = [a] + \{a\} \rightarrow [a] + \{a\} + [b] = 5.2 \quad [a] + [b] = 5$$

$$b = [b] + \{b\} \rightarrow [a] + \{b\} - [a] = 2.2 \quad [b] - [a] = 2$$

$$[b] = 3, [a] = 1 \rightarrow b = 3.2, a = 1.2 \quad a + b = 4.4$$

$$191 - 1 < (1 + \sqrt{2})^6 < 191$$

$$191 < (1 + \sqrt{2})^6 < 191 \rightarrow [(1 + \sqrt{2})^6] = 191$$

$$1 - \sqrt{2} < 0 \rightarrow (1 - \sqrt{2})^6 > 0$$

$$(1 + \sqrt{2})^6 + (1 - \sqrt{2})^6 = 192$$

$$-1 < (1 - \sqrt{2})^6 < 0$$

Aman