

$$\frac{1}{n-1} = |n-1| \rightarrow |n-1|(n-1) - 1 = 0$$

$$(n-1)^2 - 1 = n^2 - 2n$$

$$\Delta = 4 - 1 = 3$$

$$-n^2 + 2n - 1 = 0 \rightarrow n < 1$$

$$\Delta < 0$$

$$n^2 - 2n = 0 \rightarrow n(n-2) = 0 \rightarrow n = 0 \text{ or } n = 2$$

$$\text{الف) } \left| \frac{2n-1}{n} \right| < 2 \rightarrow \begin{cases} \frac{2n-1}{n} < 2 \rightarrow -\frac{1}{n} < 0 \rightarrow n > 0 \text{ (I)} \\ \frac{2n-1}{n} > -2 \rightarrow \frac{3n-1}{n} > 0 \end{cases}$$

$$\text{(I)} \cap \text{(II)} = \left(\frac{1}{2}, +\infty \right)$$

$$\rightarrow (-\infty, 0) \cup \left(\frac{1}{2}, +\infty \right) \text{ (II)}$$

$$\text{ب) } \left| \frac{n-2}{2n+1} \right| > 1 \rightarrow \begin{cases} \frac{n-2}{2n+1} > 1 \rightarrow \frac{-n-3}{2n+1} > 0 \rightarrow \frac{-n-3}{2n+1} > 0 \rightarrow (-3, -\frac{1}{2}) \text{ (I)} \\ \frac{n-2}{2n+1} < -1 \rightarrow \frac{3n-1}{2n+1} < 0 \rightarrow \frac{3n-1}{2n+1} < 0 \rightarrow (-\frac{1}{3}, \frac{1}{2}) \text{ (II)} \end{cases}$$

$$\text{(I)} \cup \text{(II)} = \left(-3, -\frac{1}{2} \right) \cup \left(-\frac{1}{3}, \frac{1}{2} \right)$$

$$x^2 < |x+5|$$

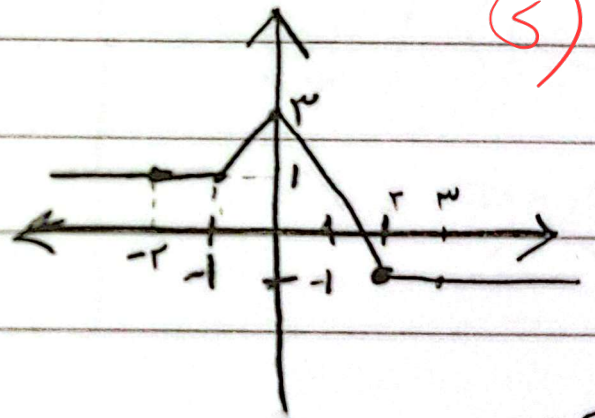
$$\begin{cases} x+5 > x^2 \rightarrow x^2 - x - 5 < 0 & \begin{matrix} -2 & 3 \\ \downarrow & \downarrow \\ x & x \end{matrix} \\ x+5 < -x^2 \rightarrow x^2 + x + 5 < 0 \rightarrow \Delta < 0 \quad \times \end{cases}$$

$$\left|x - \frac{1}{x}\right| < \frac{5}{x} \Rightarrow \underline{\beta = \frac{5}{x}}, \quad \underline{\alpha = \frac{1}{x}}$$

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

-2	-1	0	2	3
1	1	3	-1	-1

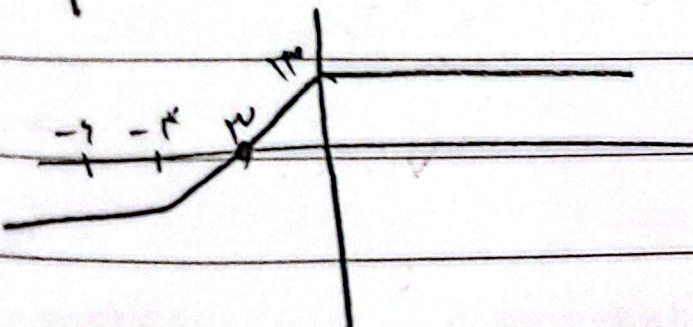
بیشترین = 3 ، کمترین = -1
 $3 - 1 = 2$



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

$$\left|\frac{1}{x} + 2\right| - 2 + 1 = 0 \Rightarrow \left|\frac{x}{x} + 2\right| - 1 = 0$$

-5	-2	0	2
-1	-1	3	3



$x = -3$

1) الف) $f(x) = [1-x] - [x+1]$

2) $\begin{cases} [-2] & 1 < x \\ [-2x-1] & -1 \leq x < 1 \\ [0] & x < -1 \end{cases} \quad (\pm \infty, \pm 1, \pm 2, \pm 1, 0)$

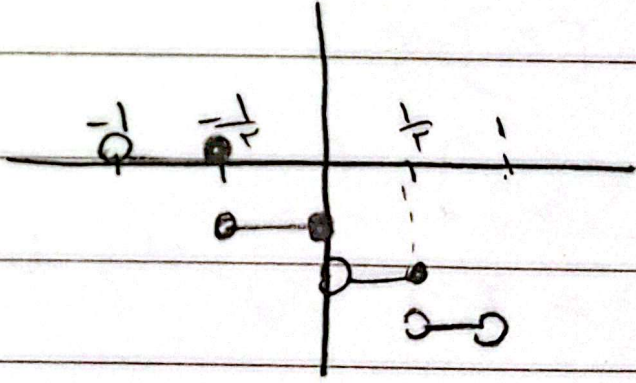
6) ب) $f(x) = \frac{1}{x} - \left[\frac{x+1}{x} \right] \rightarrow \frac{1}{x} - \left[\frac{1}{x} \right] - 1$ (5)

8) $0 \leq \frac{1}{x} - \left[\frac{1}{x} \right] < 1$

9) $\rightarrow -1 \leq \frac{1}{x} - \left[\frac{1}{x} \right] < 0 \rightarrow [-1, 0)$

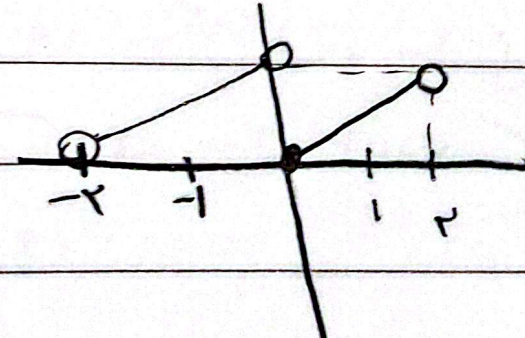
الف) $y = [-2x] - 1 \quad x \in (-1, 1)$

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



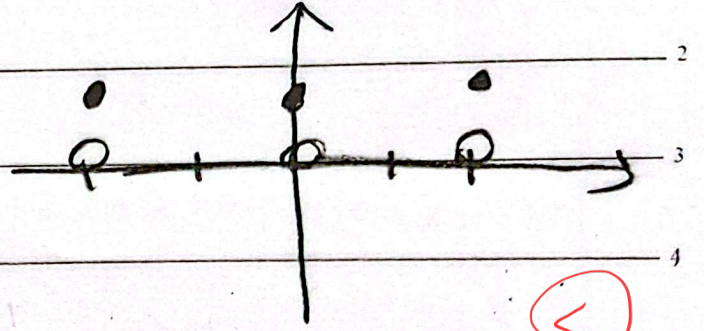
ب) $y = x - 2 \left[\frac{x}{2} \right] \quad x \in (-2, 2)$

2) $\begin{cases} x+2-2 < x < 0 \\ x & 0 \leq x < 2 \end{cases}$

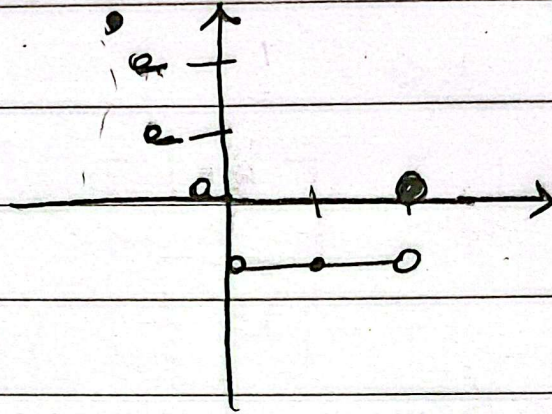


$$الف) y = [|n| - 1], \quad n \in [-2, 2]$$

-1



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



$$a + [b] = 5/2$$

$$b - [a] = 2/5$$

-9

$$b - [a] = 2/5 \rightarrow b \rightarrow 2/5 \text{ real number}$$

$$a + [b] = 5/2 \rightarrow 0/2 \rightarrow a \text{ real number}$$

$$[b] - [a] = 2$$

$$[b] + [a] = 5$$

$$2[b] = 9 \Rightarrow [b] = 4, [a] = 1 \Rightarrow a = 1/2, b = 3/2$$

$$a + b = 1/2 + 3/2 = 5/2$$

$$(1 + \sqrt{2})^2 + (1 - \sqrt{2})^2 = 11$$

$$11 - ((1 - \sqrt{2})^2)^2 = 11 - (3 - 2\sqrt{2})^2 =$$

$$11 - (4 + 2 - 4\sqrt{2} - 12\sqrt{2}) = 11 - 6 + 16\sqrt{2} = 5 + 16\sqrt{2}$$

$$= 16\sqrt{2}/11 \Rightarrow [16\sqrt{2}/11] = 16$$