

ما هو الحل الجبري - لا زلنا نسئله

$$\frac{1}{n-1} = |n-1| \rightarrow \frac{1}{n-1} > 0 \rightarrow \frac{1}{-3} > 0 \rightarrow \boxed{n > 1}$$

$$(n-1)^2 = 1 \rightarrow \begin{cases} n=2 \rightarrow \text{حل} \\ n=0 \rightarrow \text{حل} \end{cases} \rightarrow \boxed{\text{الحل: } n=2, 0}$$

الف) $\left| \frac{n-1}{n} \right| < 2 \rightarrow$

$$\frac{\varepsilon n^2 - \varepsilon n + 1}{n^2} < \varepsilon \rightarrow \varepsilon n^2 - \varepsilon n + 1 < \varepsilon n^2$$

$$\varepsilon n - 1 > 0 \rightarrow \boxed{n > \frac{1}{\varepsilon}}$$

ب) $\left| \frac{n-2}{n+1} \right| > 1 \rightarrow$

$$\frac{n^2 - \varepsilon n + \varepsilon}{\varepsilon n^2 + \varepsilon n + 1} > 1 \rightarrow \frac{n^2 - \varepsilon n + \varepsilon}{\varepsilon n^2 + \varepsilon n + 1} > \frac{\varepsilon n^2 + \varepsilon n + 1}{\varepsilon n^2 + \varepsilon n + 1}$$

$$n^2 - \varepsilon n + \varepsilon > \varepsilon n^2 + \varepsilon n + 1$$

$$n^2 + 8n - 3 < 0 \rightarrow \frac{-2}{-1} < \frac{1}{1} \rightarrow (-3, \frac{1}{2})$$

$$\boxed{(-3, \frac{1}{2}) - \{-\frac{1}{2}\}} \rightarrow (-3, \frac{1}{2})$$

ج) $n^2 < |n+4|$ راجع ص ٢٣

د) $n^2 < n+4$

$$n^2 - n - 4 < 0$$

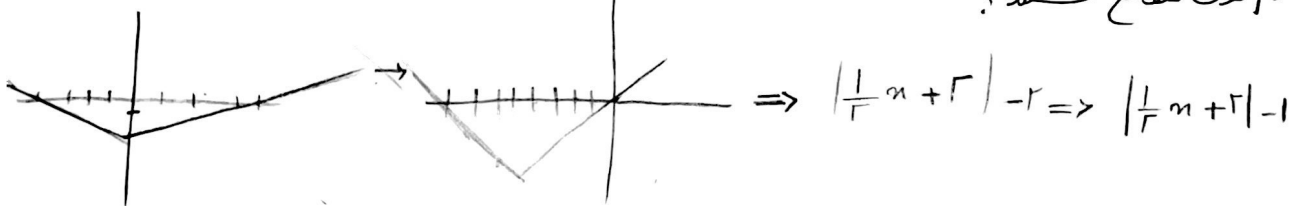
$$\frac{-2}{-1} < \frac{3}{1} \rightarrow (-2, 3)$$

$$\boxed{(-2, 3)}$$

هـ) $y = |n+1| - |2n| + |n-2|$

max = 3
min = -1

و) $y = \left| \frac{1}{n} \right| - 2$ راجع ص ٢٣



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

$n = -1$

ز) $f(n) = \left[\left| 1-n \right| - \left| n+1 \right| \right] \rightarrow \left[\left| n-1 \right| - \left| n+1 \right| \right]$

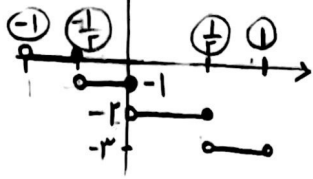
ح) $f(n) = \frac{1}{n} - \left[\frac{n+1}{n} \right]$

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

$$\boxed{[-1, 0]}$$

$$۷) y = [-2x] - 1 \quad x \in (-1, 1)$$

$$(2) -2x > 1 \Rightarrow -1 < x \leq -\frac{1}{2}$$

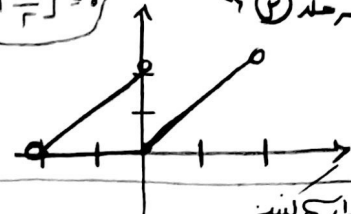


$$1 > -2x > 0 \Rightarrow -\frac{1}{2} < x < \frac{1}{2}$$

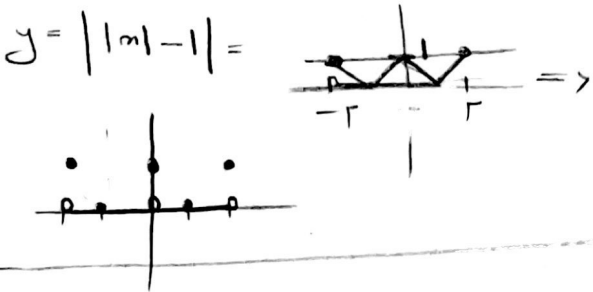
$$0 > -2x > -1 \Rightarrow 0 < x < \frac{1}{2}$$

$$-1 < \frac{x}{2} < 0 \Rightarrow -2 < x < 0 \Rightarrow x - 2(-1) = x + 2$$

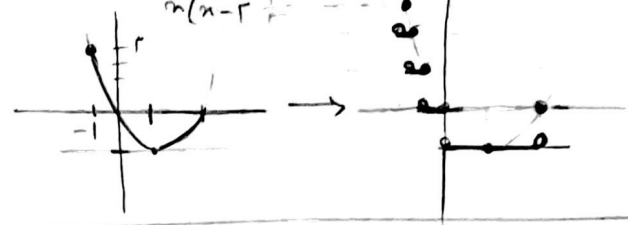
$$0 < \frac{x}{2} < 1 \Rightarrow 0 < x < 2 \Rightarrow x - 2(0) = x$$



$$۸) y = [|x-1|] \quad x \in [-2, 2]$$



$$۹) [x^2 - 2x] \quad x \in [-1, 2]$$



$$\begin{cases} [a] + [b] = 4 \\ [b] - [a] = 2 \end{cases} \Rightarrow \begin{cases} a+b = 5 \\ a-b = -1 \end{cases} \Rightarrow \begin{cases} a = 2 \\ b = 3 \end{cases}$$

$$\begin{cases} x+y=198 \\ xy=(1-\sqrt{2})^4=1 \end{cases} \Rightarrow x+\frac{1}{x}=198 \Rightarrow x^2-198x+1=0 \Rightarrow x = \frac{198 \pm \sqrt{198^2-4}}{2} = \frac{198 \pm \sqrt{39204-4}}{2} = \frac{198 \pm \sqrt{39200}}{2} = \frac{198 \pm 198\sqrt{2}}{2} = 99 \pm 99\sqrt{2}$$

چون $\frac{1}{\sqrt{2}+1} = \sqrt{2}-1$ است پس $(\frac{1}{\sqrt{2}+1})^4 = (\sqrt{2}-1)^4$ است پس $198 - \frac{1}{\sqrt{2}+1} = 197$ است.