

$$\frac{1}{n-1} = |n-1| \begin{cases} n > 1 \\ n < 1 \end{cases}$$

$\frac{1}{n-1} = n-1 \Rightarrow 1 = n^2 + 1 - 2n \Rightarrow n^2 - 2n = 0 \Rightarrow n(n-2) = 0$   
 $n < 0 \quad n < 2$   
 $0 < 0 \quad 0 < 0$

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

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ا)  $\left| \frac{n-1}{n} \right| < 2 \Rightarrow -2 < \frac{n-1}{n} < 2 \Rightarrow \begin{cases} \frac{n-1}{n} < 2 \Rightarrow \frac{1}{n} > 0 \Rightarrow n > 0 \text{ (I)} \\ -2 < \frac{n-1}{n} \Rightarrow 0 < \frac{n-1}{n} \Rightarrow (-\infty, 0) \cup (\frac{1}{2}, +\infty) \text{ (II)} \end{cases}$

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

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

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

$n^2 < n+4 \Rightarrow n^2 - n - 4 < 0 \Rightarrow n \in \left[ -\frac{1}{2}, \frac{5}{2} \right]$

$n^2 > -n-4 \Rightarrow n^2 + n + 4 > 0 \Rightarrow \Delta < 0$

$\left| n - \frac{1}{2} \right| < \frac{5}{2} \Rightarrow n \in \left[ -\frac{1}{2}, \frac{5}{2} \right]$

$B = \left[ \frac{5}{2}, \frac{5}{2} \right]$

$\begin{cases} 2 < n \Rightarrow -1 \\ 0 < n \leq 2 \Rightarrow -1n+3 \\ -1 < n < 0 \Rightarrow 2n+3 \\ n < -1 \end{cases}$

$3-1 \geq 2$

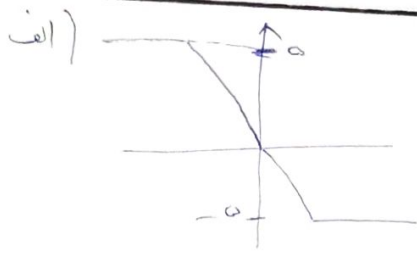
$\frac{-2}{-1} = 2$   
 $\frac{-1}{-1} = 1$

$\left| \frac{1}{2}x \right| - 2 = y \Rightarrow \left| \frac{1}{2}(x+3) \right| - 1 = y$

$\left| \frac{1}{2}x \right| - 2 = \left| \frac{1}{2}(x+3) \right| - 1 \Rightarrow \left| \frac{1}{2}x \right| - 1 = \left| \frac{1}{2}(x+3) \right|$

$y' = \left| \frac{1}{2}(x+3) \right| - 1 = y$

$|x+3| - 2 = -2$

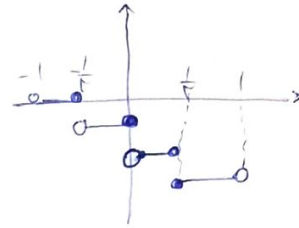
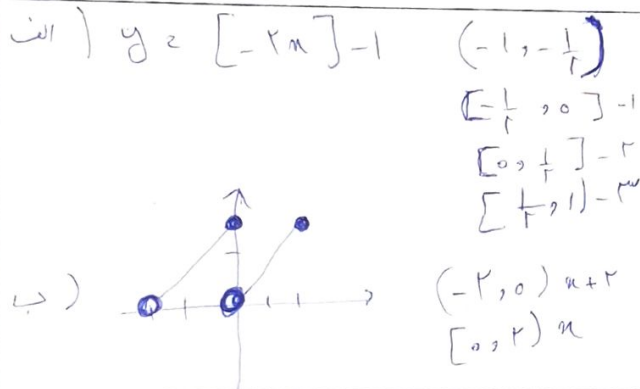


$$\begin{cases} 1 < x = [-5] \\ -1 \leq x < 1 = [-2n-3] & (-\infty, -1, -3, \dots, 5, 7) \\ x < -1 = [a] \end{cases}$$

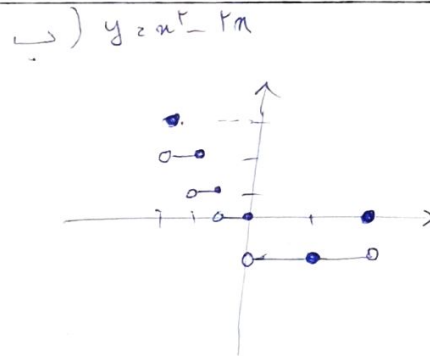
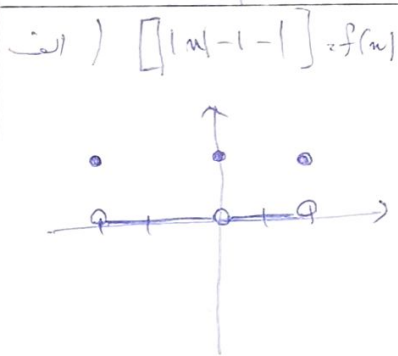
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ب)

$$\frac{1}{x} = \left[ 1 + \frac{1}{x} \right] \Rightarrow \frac{1}{x} = \left[ \frac{1}{n} \right] - 1 \Leftrightarrow 0 \leq \frac{1}{n} - \left[ \frac{1}{n} \right] < 1 \Rightarrow -1 \leq \frac{1}{n} - \left[ \frac{1}{n} \right] - 1 \Leftrightarrow [-1, 0)$$



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$b - [a] = 2, 4 \rightarrow a, 4 = b$

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

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$$\begin{aligned} (1 + \sqrt{2})^4 &= 191 - (1 - \sqrt{2})^4 = 191 - [(1 - \sqrt{2})^2]^2 = 191 - [3 - 2\sqrt{2}]^2 = \\ 191 - [9 + 4 - 12\sqrt{2} - 12\sqrt{2}] &= 191 - [99 - 24\sqrt{2}] = 8 \\ 191 - 99 + 24\sqrt{2} &= 191, 99 \Rightarrow [191, 99] = 191 \end{aligned}$$

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