

ESERCIZIO N 14 PAG 309

$$\lim_{x \rightarrow 2} \sqrt{3x+3} = 3$$

$\forall \varepsilon > 0 \exists I_\varepsilon(3)$ e corrispondentemente $\exists I_\delta(2) \mid \forall x \in I_\delta(2)$ si ha che

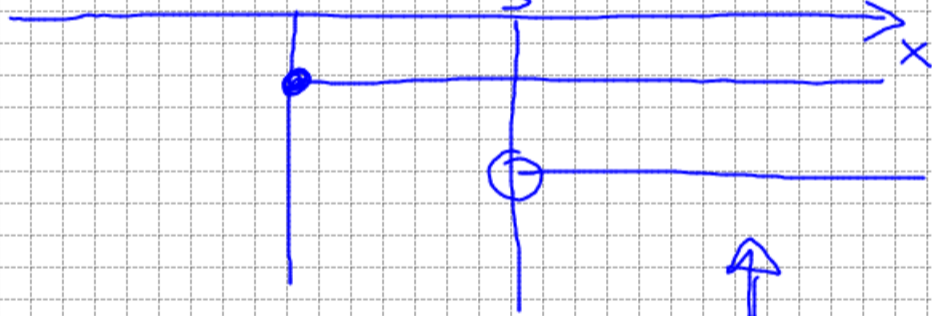
$$|\sqrt{3x+3} - 3| < \varepsilon \quad -\varepsilon < \sqrt{3x+3} - 3 < \varepsilon$$

$$\begin{cases} \sqrt{3x+3} - 3 > -\varepsilon & \textcircled{1} \\ \sqrt{3x+3} - 3 < \varepsilon & \textcircled{2} \end{cases} \begin{cases} \sqrt{3x+3} > 3 - \varepsilon \\ \sqrt{3x+3} < 3 + \varepsilon \end{cases}$$

$\textcircled{1} \sqrt{3x+3} > 3 - \varepsilon$

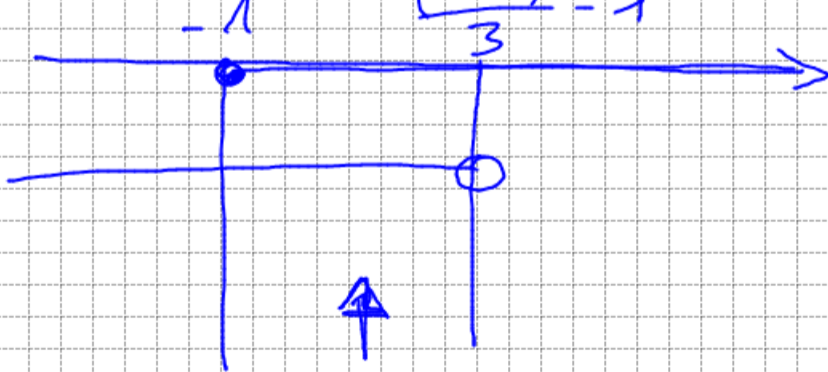
$$\begin{cases} 3x+3 \geq 0 \\ 3-\varepsilon < 0 \end{cases} \cup \begin{cases} 3-\varepsilon > 0 \\ 3x+3 > (3-\varepsilon)^2 \end{cases}$$

$$\begin{cases} x \geq -1 \\ \varepsilon > 3 \end{cases} \cup \begin{cases} \varepsilon \leq 3 \\ x > \frac{(3-\varepsilon)^2}{3} - 1 \end{cases}$$



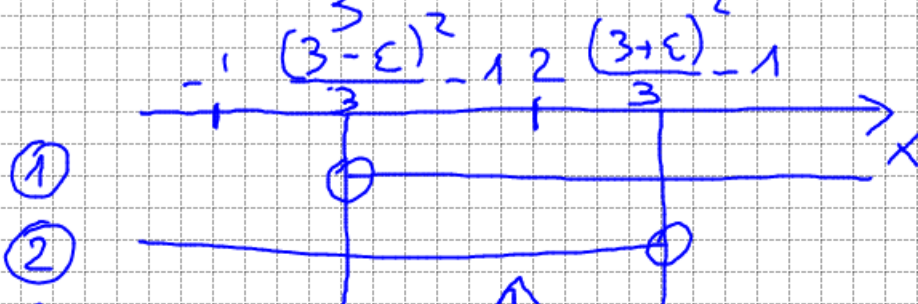
$\textcircled{2} \sqrt{3x+3} < 3 + \varepsilon$

$$\begin{cases} 3x+3 \geq 0 \\ 3+\varepsilon > 0 \\ 3x+3 < (3+\varepsilon)^2 \end{cases} \begin{cases} x \geq -1 \\ \varepsilon > -3 \\ x < \frac{(3+\varepsilon)^2}{3} - 1 \end{cases}$$



$$\frac{(3-\varepsilon)^2}{3} - 1 = \frac{9 + \varepsilon^2 - 6\varepsilon - 3}{3} = \frac{\varepsilon^2 - 6\varepsilon + 2}{3}$$

$$\frac{(3+\varepsilon)^2}{3} - 1 = \frac{9 + 6\varepsilon + \varepsilon^2 - 3}{3}$$



$\textcircled{1}$
 $\textcircled{2}$
 \cup

↑ intorno di 2