$$\lim_{x\to 1} \frac{2x^2-x-1}{x-1} = 3$$

$\forall \varepsilon>0 \ \exists \ I_\varepsilon(3)$ E CORRISPONDENTEMENTE

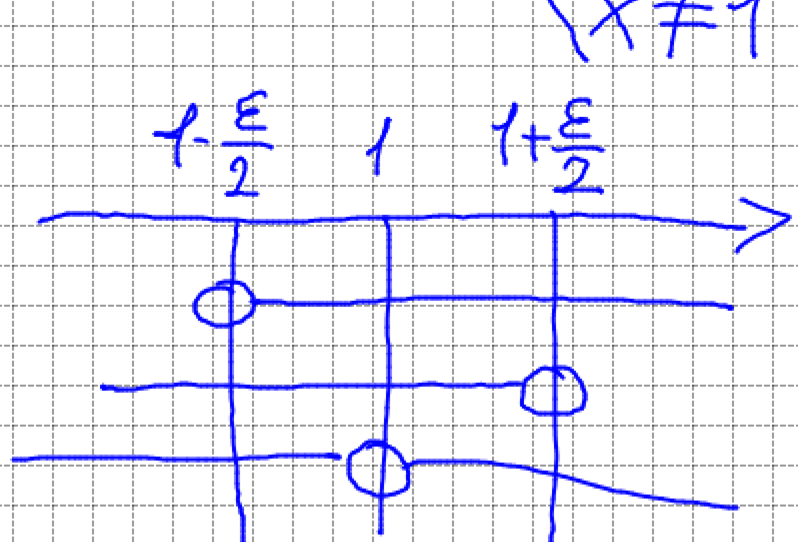
$\exists \ I_\delta(1) \ / \ \forall x \in I_\delta(1) \Rightarrow |f(x)-3|<\varepsilon$

$$\left|\frac{2x^2-x-1}{x-1}-3\right|<\varepsilon \qquad \left|\frac{2x^2-x-1-3x+3}{x-1}\right|<\varepsilon$$

$$\left|\frac{2x^2-4x+2}{x-1}\right|<\varepsilon \qquad \begin{cases}\left|\dfrac{2(x-1)^{\cancel{2}}}{\cancel{x-1}}\right|<\varepsilon \\ x\neq 1\end{cases}$$

$$\begin{cases}|2x-2|<\varepsilon \\ x\neq 1\end{cases} \qquad \begin{cases}-\varepsilon<2x-2<\varepsilon \\ x\neq 1\end{cases}$$

$$\begin{cases}2x-2>-\varepsilon \\ 2x-2<\varepsilon \\ x\neq 1\end{cases} \qquad \begin{cases}x>\dfrac{2-\varepsilon}{2} \\ x<\dfrac{\varepsilon+2}{2} \\ x\neq 1\end{cases} \qquad \begin{cases}x>1-\dfrac{\varepsilon}{2} \\ x<1+\dfrac{\varepsilon}{2} \\ x\neq 1\end{cases}$$



$$\left(1-\frac{\varepsilon}{2}, 1\right) \cup \left(1, 1+\frac{\varepsilon}{2}\right)$$

CONTRO ESEMPIO

$$\lim_{x\to 1}\frac{2x^2-x-1}{x-1}=0$$

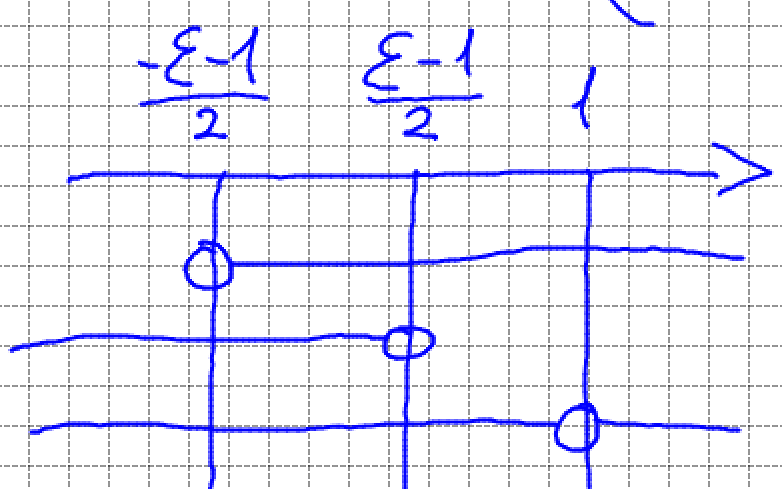
$\forall \varepsilon>0\ \exists I_\varepsilon(0)$ E CORRISPONDENTEMENTE

$\exists I_\delta(1) \,/\, \forall x\in I_\delta(1) \Rightarrow |f(x)-0|<\varepsilon$

$$\left|\frac{2x^2-x-1}{x-1}\right|<\varepsilon \qquad \begin{cases}\left|\dfrac{(2x+1)\cancel{(x-1)}}{\cancel{x-1}}\right|<\varepsilon\\[2ex] x\neq 1\end{cases}$$

$$\begin{cases}-\varepsilon<2x+1<\varepsilon\\ x\neq 1\end{cases}$$

$$\begin{cases}2x+1>-\varepsilon\\ 2x+1<\varepsilon\\ x\neq 1\end{cases} \qquad \begin{cases}x>\dfrac{-\varepsilon-1}{2}\\[1ex] x<\dfrac{\varepsilon-1}{2}\\[1ex] x\neq 1\end{cases}$$



$$\left(\frac{-\varepsilon-1}{2},\frac{\varepsilon-1}{2}\right)$$