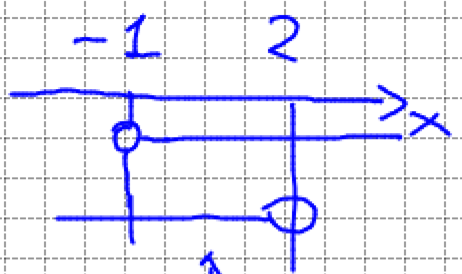
ESEMPIO

$$\log_{\frac{1}{3}}(x+1) - 2\log_{\frac{1}{3}}(2-x) \le 1$$

$$C.E \left\{ x \in \mathbb{R} \;\middle|\; \begin{cases} x+1>0 \\ 2-x>0 \end{cases} \Rightarrow \begin{cases} x>-1 \\ x<2 \end{cases} \right.$$



C.E $(-1;2)$

$$\begin{cases} \log_{\frac{1}{3}}(x+1) - 2\log_{\frac{1}{3}}(2-x) \le 1 \\ -1<x<2 \end{cases}$$

$$\log_{\frac{1}{3}}(x+1) - \log_{\frac{1}{3}}(2-x)^2 \le 1$$

$$\begin{cases} \log_{\frac{1}{3}}\dfrac{(x+1)}{(2-x)^2} \le 1 \\ -1<x<2 \end{cases} \qquad \begin{cases} \dfrac{x+1}{(2-x)^2} \ge \dfrac{1}{3} \\ -1<x<2 \end{cases}$$

$$\begin{cases} \dfrac{3x+3-4-x^2+4x}{3(2-x)^2} \ge 0 \\ -1<x<2 \end{cases}$$

$$\begin{cases} \dfrac{-x^2+7x-1}{3(2-x)^2} \ge 0 \\ -1<x<2 \end{cases}$$

N $\quad -x^2+7x-1 \ge 0 \qquad -x^2+7x-1=0$

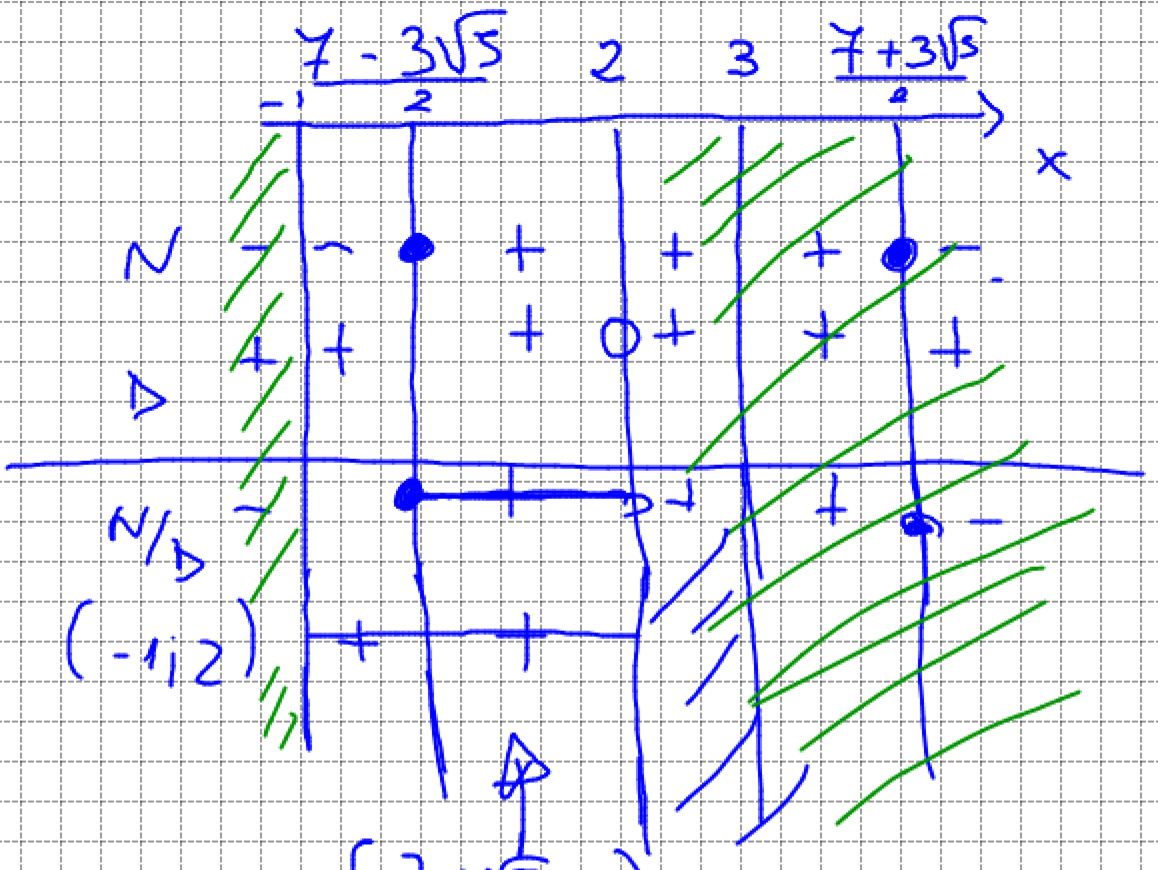
$$x_{1,2} = \frac{-7\pm\sqrt{49-4}}{-2} = \frac{-7\pm\sqrt{45}}{-2}$$

$$x_{1,2} = \begin{cases} \dfrac{7+3\sqrt{5}}{2} \\ \dfrac{7-3\sqrt{5}}{2} \end{cases}$$

D $\quad 3(2-x)^2 > 0$

$3>0$ sempre

$(2-x)^2>0$ sempre + escluso $x=2$



$$\left[\frac{7-3\sqrt{5}}{2}; 2\right)$$