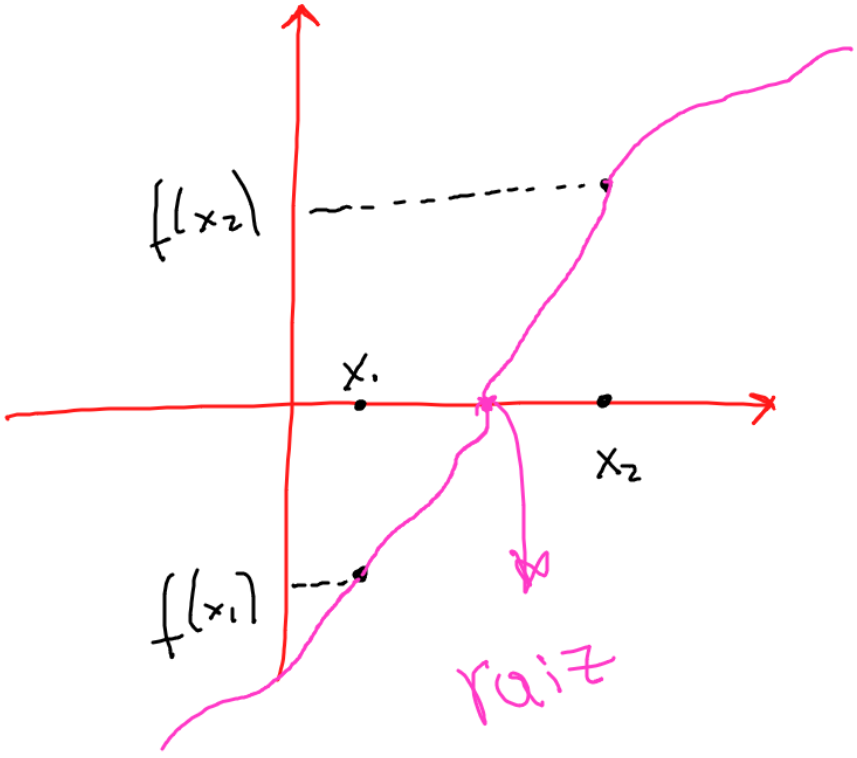


Bolzano

$$\left.\begin{array}{l} f \quad \text{cont.} \\ f(x_1) < 0 \\ f(x_2) > 0 \end{array}\right\}$$

$\Rightarrow \exists$ al menos una raiz

Teo. de Bolzano

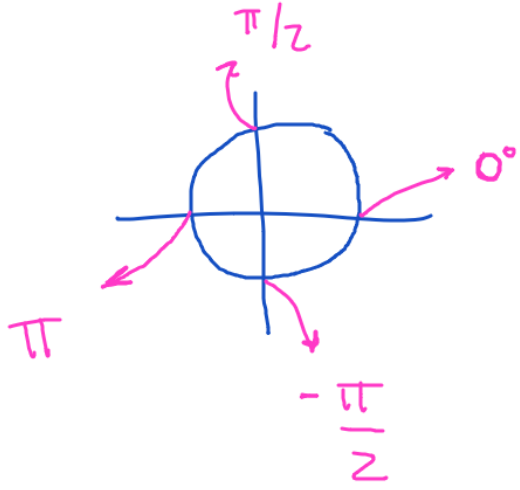
$-\frac{\pi}{2} + 2\cos\left(-\frac{\pi}{2}\right) = -\frac{\pi}{2}$

① $\underbrace{x + 2\cos(x)}_{f(x)} = 0$ tiene AL MENOS 1 sol.

f es cont.

$f(x=0) > 0 \quad (f(x=0) = 2)$

$f\left(x = -\frac{\pi}{2}\right) < 0 \quad \left(f\left(x = -\frac{\pi}{2}\right) = -\frac{\pi}{2}\right)$



$\Rightarrow$ x Bolzano $\exists\, x_0 \,/\, f(x_0) = 0$ o lo que es lo mismo $x_0 + 2\cos(x_0) = 0$ lqqd

$$x^{117} + \frac{534}{1 + x^2 + \operatorname{sen}^2(x)} = 1212$$

$$x^{117} + \frac{534}{1 + x^2 + \operatorname{sen}^2(x)} - 1212 = 0$$

$\exists x_0$ tq. $f(x_0) = 0$

$$\underbrace{x^{117}}_{\text{para } x>0 \Rightarrow g(x)>0 \quad \text{para } x<0 \Rightarrow g(x)<0} + \frac{534}{1+x^2+\operatorname{sen}^2(x)} - 112 = f(x)$$

$1+x^2+\operatorname{sen}^2(x) \geq 0$

$(1 + x^2 + \operatorname{sen}^2(x) > 0)$

$x^2 \geq 0$

$\operatorname{sen}^2(x) \geq 0$

f cont.

$\Rightarrow$ x Bolzano $\exists x_0$ tq. $f(x_0) = 0$

$f(x=2) > 0$

$f(x=-2) < 0$