
EBREI


UN
MIGJARDO
DI EURO
1 000 000 000€

N 12

$I\ [-\sqrt{2}; \frac{3}{2}]$

$$f(x)\begin{cases} x^2+1 & x \le 1 \\ 2x & x > 1 \end{cases}$$

1) $f_-(1)=2$

$f_+(1)=\lim_{x\to 1^+} 2x = 2$

quindi la $f(x)$ è continua per $x=1$

2) $$f'(x)=\begin{cases} 2x & x\le 1 \\ 2 & x>1 \end{cases}$$

$f'_-(1)=2$

$f'_+(1)=\lim_{x\to 1^+} 2 = 2$

quindi $f(x)$ è derivabile in I.

3) $f(-\sqrt{2}) = f\left(\frac{3}{2}\right)$? OK

$f(-\sqrt{2})=3$

$f\left(\frac{3}{2}\right)=3$

posso applicare il teorema di Rolle => esiste almeno un punto c interno all'intervallo I, quindi

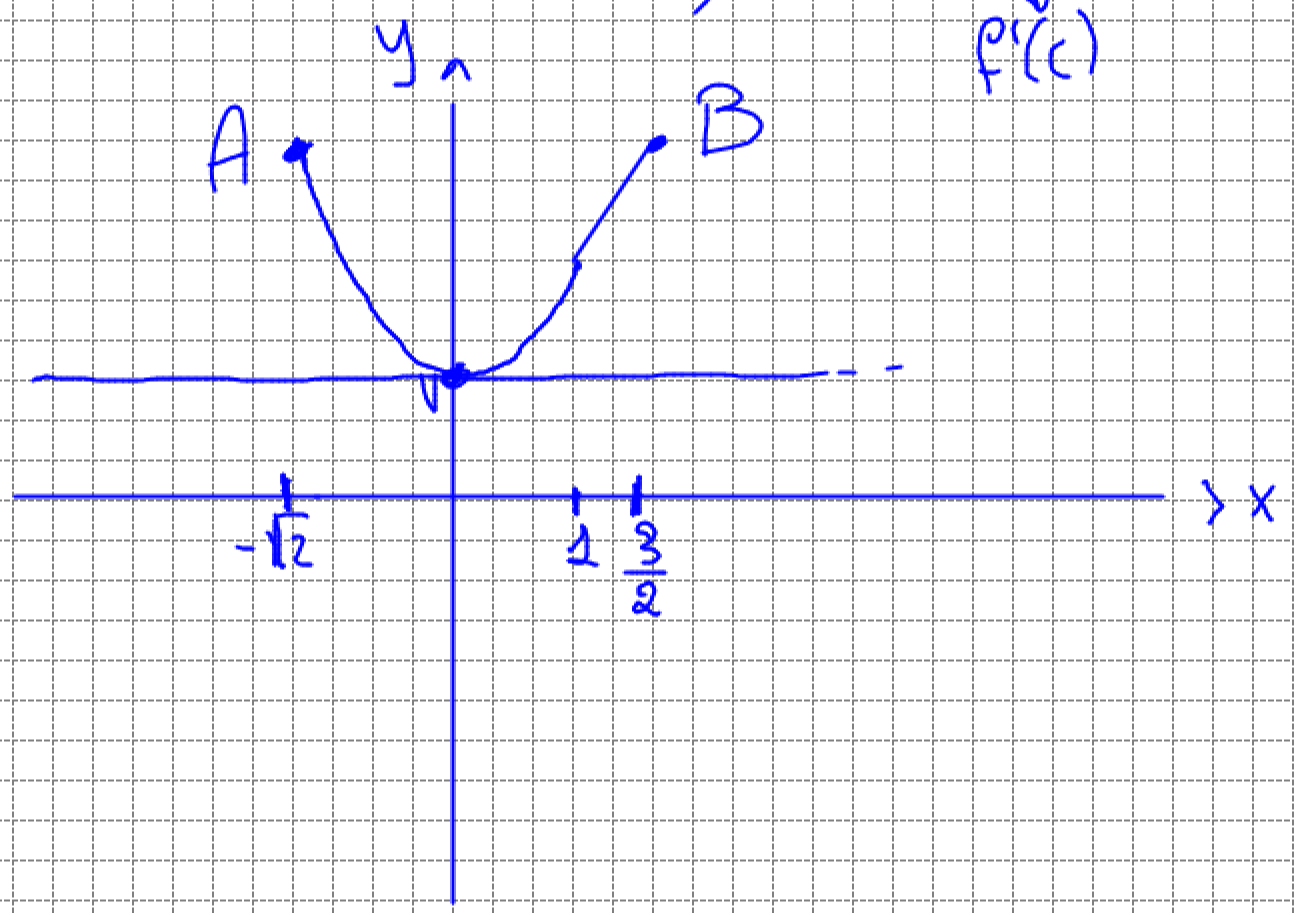
$f'(c)=0$

$f'(c)=0$ in $(-\sqrt{2}; 1)$ => $\underbrace{2c}_{f'(c)}=0$ $\boxed{c=0}$

$f'(c)=0$ in $\left(1; \frac{3}{2}\right)$ => $\underbrace{2}_{f'(c)}=0$

$y=x^2+1$

$y=2X$



$y = f(x)$ def $I = [a, b]$

1) continua in I
2) derivabile in (a, b)
3) $f(a) = f(b)$

Allora $\exists$ almeno $c \in (a, b) \,/\, f'(c) = 0$

Dim

$M = m \qquad m = f(e) = f(x) = f(d) = M$

$M > m \qquad m \leq f(e) < f(x) < f(d) \leq M$

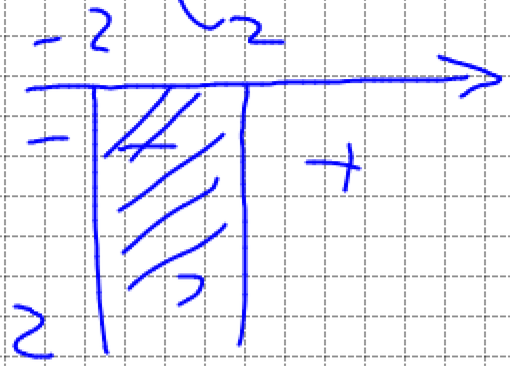
$$\lim_{h \to 0} \frac{f(e+h) - f(e)}{h}$$

$f(e+h) \geq f(e) \qquad h > 0 \qquad f$

es. 380

$$f(x)\begin{cases}\sqrt{4-x^2} & |x|\leq 2\\ \sqrt{|x-2|} & |x|>2\end{cases} \Rightarrow \begin{cases}\sqrt{4-x^2} & -2\leq x\leq 2\\ \sqrt{|x-2|} & x<-2 \cup x>2\end{cases}$$

$x-2\geq 0 \quad x\geq 2$



$\sqrt{x-2}$ per $x>2$

$\sqrt{2-x}$ per $x<-2$

$$f(x)=\begin{cases}\sqrt{4-x^2} & \text{per } -2\leq x\leq 2\\ \sqrt{x-2} & \text{per } x>2\\ \sqrt{2-x} & \text{per } x<-2\end{cases}$$

$|x|<a \quad -a<x<a$

$|x|>a \quad x<-a \cup x>a$