Richiami
- m. di Newt
- $\exists$ <u>certam</u> $[a,b]$ che verifica ip Teo conv loc
- ordine di conv <u>almeno</u> 2

<u>Oss</u> (int geom): "metodo delle tangenti"

<u>Oss</u> (scelta x_0): <u>SE</u> $\forall x \in [a,b]$, $f'(x) \neq 0$, $f''(x) \neq 0$ ...

<u>Es</u>: $f(x) = x^2 - 2$, $[a,b] = [1,2]$ ...

<u>Oss</u>:

$$
\begin{aligned}
0 = f(\alpha) &= f(x_{k-1}) + f'(x_{k-1})(\alpha - x_{k-1}) + \frac{f''(\theta)}{2}(\alpha - x_{k-1})^2 \\
0 &= f(x_{k-1}) + f'(x_{k-1})(x_k - x_{k-1}) \\
\hline
0 &= f'(x_{k-1})(\alpha - x_k) + \frac{f''(\theta)}{2}(\alpha - x_{k-1})^2
\end{aligned}
$$

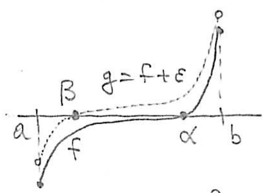
$$\Rightarrow \boxed{x_{k+1} - \alpha = \frac{f''(\theta)}{2 f'(x_k)} (x_k - \alpha)^2}$$

<u>Pb</u>: criterio d'arresto?

- <u>Condizionamento</u>: $f \in C^1$, $[a,b]$, $\varepsilon > 0$ t.c. $\begin{cases} f'(x) \neq 0 \text{ su } [a,b] \\ f(a) f(b) < 0 \\ |f(a)|, |f(b)| > \varepsilon \end{cases}$

  e $g \in C^0$ t.c. $|g(x) - f(x)| < \varepsilon$ su $[a,b]$

  <u>es</u>:



  $\Rightarrow$ • $\exists \beta$ zero di g in $[a,b]$
  • $m \equiv \min |f'(x)|$ su $[a,b]$, $|\alpha - \beta| \leq \dfrac{\varepsilon}{m}$

  <u>Oss</u>: condiz <u>dip da</u> m!

- <u>Stabilita'</u>: • h, $[a,b]$ che verif le ip Teo conv loc con $L \in [0,1)$
  • $\varphi : M \to M$ t.c. $|\varphi(\xi) - h(\xi)| \leq \delta$ su $[a,b] \cap M$
  • $\xi_k = \varphi(\xi_{k-1})$, $k = 1, 2, \ldots$ tutti in $[a,b]$

<u>ALLORA</u>: $|\xi_k - \alpha| \leq L^k |\xi_0 - \alpha| + \dfrac{1 - L^k}{1 - L} \delta$

p.u. di h in $[a,b]$