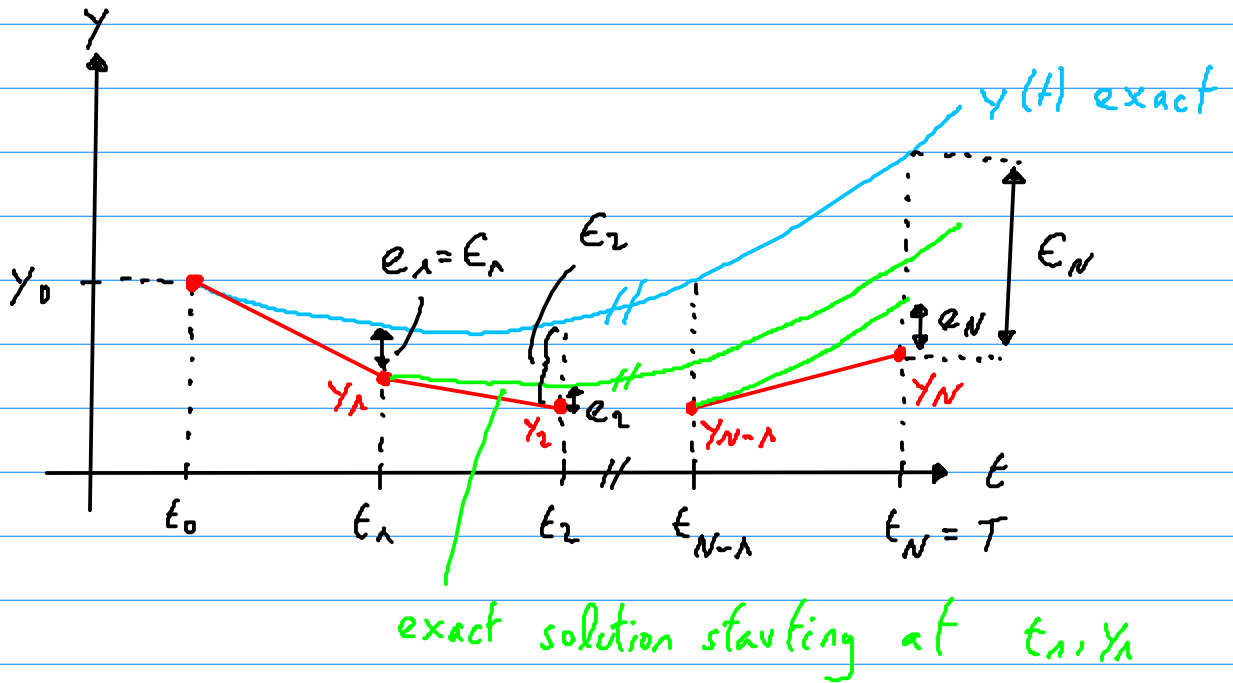


Graphically:



The LTE can "easily" be obtained by a Taylor expansion:

Ex.: (7) LTE of  $\text{EE } \phi(t_j, y_j, y_{j+n}, h) = f(t_j, y_j)$

$$e_j \stackrel{\text{Def.}}{=} y(t_j) - \left( y(t_{j-1}) + h \cdot \phi(t_{j-1}, y(t_{j-1}), y(t_j)) \right)$$

$$= y(t_j) - y(t_{j-1}) - h \cdot f(t_{j-1}, y(t_{j-1}))$$

$$= y(t_{j-1} + h) - y(t_{j-1}) - h \cdot f(t_{j-1}, y(t_{j-1}))$$

$$\text{Taylor} \quad = \cancel{y(t_{j-1})} + \cancel{h \cdot \dot{y}(t_{j-1})} + \frac{h^2}{2} \ddot{y}(t_{j-1}) + \frac{h^3}{6} \dddot{y}(t_{j-1}) + \dots$$

ODE  $f(t_{j-1}, y(t_{j-1}))$

$$- \cancel{y(t_{j-1})} - h \cdot \cancel{f(t_{j-1}, y(t_{j-1}))}$$

$$= \frac{h^2}{2} \ddot{y}(t_{j-1}) + h^3(\dots) + h^4(\dots) + \dots = \mathcal{O}(h^2)$$