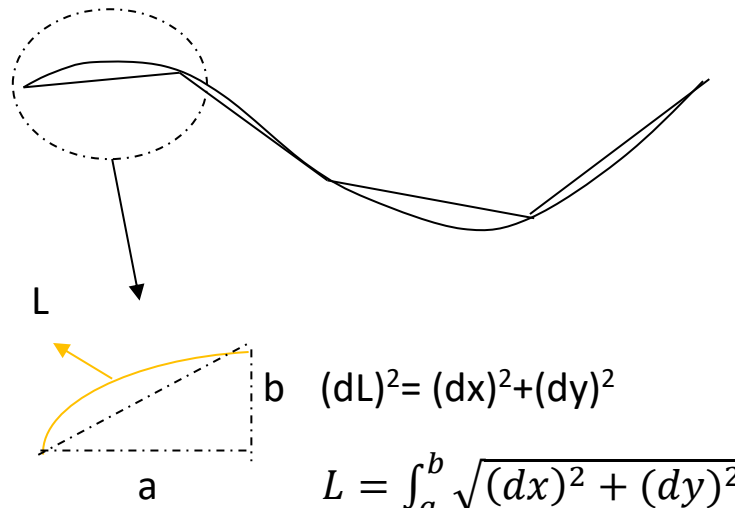


ARCLENGTH:

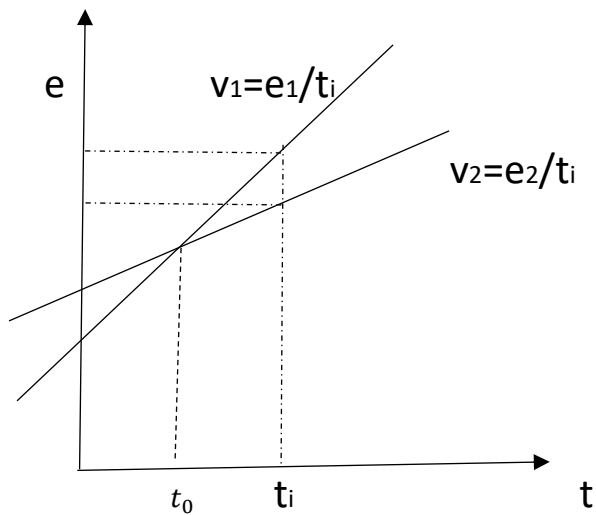


i sabent la dedinició de derivada: " $f'(x) = dy/dx$ "

$$L = \int_a^b \sqrt{1 + (f'(x))^2} dx$$

$$L = \int_a^b \sqrt{(x'(t))^2 + (y'(t))^2} dt$$

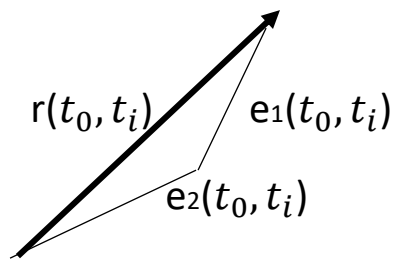
$$x(t) = t \quad i \quad y(t) = u(t)$$



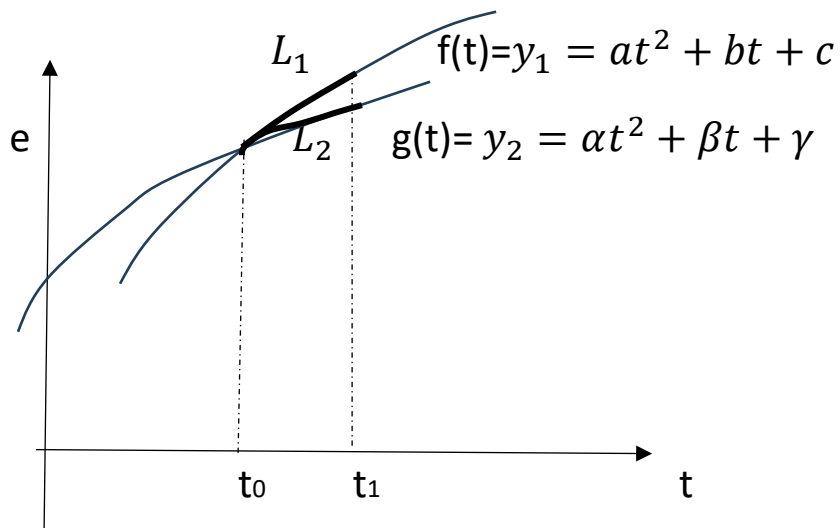
$e_1 = v_1 \cdot t + e_0$ on $e_0 + v_1 \cdot t_0 = v_2 \cdot t_0 + e_3$ i $v_1 =$ pendent d' e_1

$e_2 = v_2 \cdot t + e_3$ $v_2 =$ pendent d' e_2

quan $e_1(t_0, t_i)$ i $e_2(t_0, t_i)$ se sumen, obtenim $r(t_0, t_i)$:



i en e_1 i e_2 corbes, succeeix el mateix:



$$L_1 = \int_{t_0}^{t_1} \sqrt{1 + (f'(t))^2} dt = \int_{t_0}^{t_1} \sqrt{1 + (2at + b)^2} dt =$$

$$(a=1, b=3, c=2, t_0=3, t_1=4)$$

$$= \int_{t_0}^{t_1} \sqrt{1 + 9 + 12t + 4t^2} dt = \int_{t_0}^{t_1} \sqrt{10 + 12t + 4t^2} dt$$

Segons el "mètode Alemán":

$$\frac{10+12t+4t^2}{\sqrt{10+12t+4t^2}} = \frac{d}{dt} ((mt + n) \cdot \sqrt{10 + 12t + 4t^2}) + \frac{\lambda}{\sqrt{10+12t+4t^2}} \rightarrow$$

$$\rightarrow m \cdot \sqrt{10 + 12t + 4t^2} + (mt+n)(1/2) \cdot \frac{(8t+12)}{\sqrt{10+12t+4t^2}} + \frac{\lambda}{\sqrt{10+12t+4t^2}}$$

$$\rightarrow m \cdot (10 + 12t + 4t^2) + (mt+n)(4t + 6) + \lambda = 10 + 12t + 4t^2$$

$$m=1/2, n=3/4, \lambda=-9/2$$

$$\rightarrow \sqrt{10 + 12t + 4t^2} =$$

$$= \frac{d}{dt} \left(\left(\frac{1}{2} \right) t + \left(\frac{3}{4} \right) \cdot \sqrt{10 + 12t + 4t^2} \right) + \frac{\left(-\frac{9}{2} \right)}{\sqrt{10+12t+4t^2}}$$

$$[10 + 12t + 4t^2 = (2t + 3)^2 + 1]$$

$$\text{Integrem els 2 costats de la igualtat i la part } \int_{t_0}^{t_1} \frac{\left(-\frac{9}{2} \right)}{\sqrt{(2t+3)^2+1}} dt =$$

$$\rightarrow = \left(-\frac{9}{2} \right) \cdot \left(\frac{1}{2} \right) \cdot \text{ArcSinh}(2t+3) \Big|_{t_0}^{t_1}$$

$$\text{Per tant: } \left[\left(\frac{1}{2} \right) t + \left(\frac{3}{4} \right) \cdot \sqrt{10 + 12t + 4t^2} \right] \Big|_3^4 +$$

$$+ \left(-\frac{9}{2} \right) \cdot \left(\frac{1}{2} \right) \cdot \text{ArcSinh}(2t+3) \Big|_3^4$$