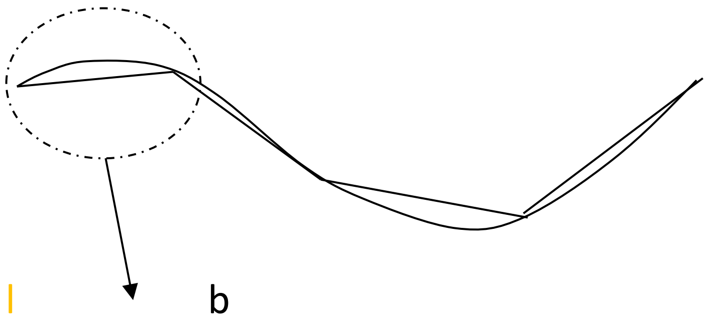
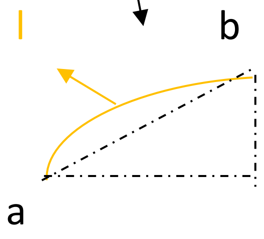
ARCLENGTH:





$(dl)^2 = (dx)^2 + (dy)^2$

$l = \int_a^b \sqrt{(dx)^2 + (dy)^2}$

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

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

En triangle no rectangle s= $\int_a^b \sqrt{\left(x'(t)\right)^2 + (y'(t))^2dt}$

x(t)= u(t) i y(t)=v(t) $s = \int_a^b \sqrt{\left\| \frac{d}{dt}\vec{r}(u(t), v(t)) \right\|}\, dt =$

$= \int_a^b \sqrt{u'(t)^2\overrightarrow{r_u r_u} + 2u'(t)v'(t)\overrightarrow{r_u r_v} + v'(t)^2\overrightarrow{r_v r_v}}\, dt$

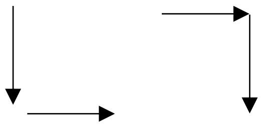
On $\overrightarrow{r_u}$ i $\overrightarrow{r_v}$ són els respectius vectors unitaris de u(t) i v(t).

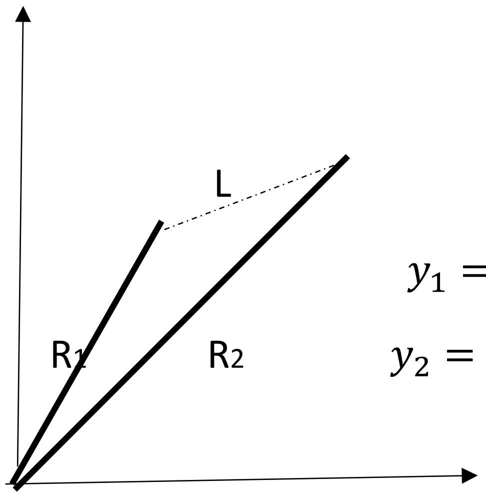
ds^2= (du dv)$\begin{pmatrix} E & F \\ F & G \end{pmatrix}\begin{pmatrix} du \\ dv \end{pmatrix}$ on E=$\overrightarrow{r_u r_u}$, F=$\overrightarrow{r_u r_v}$, G=$\overrightarrow{r_v r_v}$

i on $\vec{r} = \vec{u} + \vec{v}$ si $\vec{u}$ fos perpendicular a $\vec{v}$ el terme

$2u'(t)v'(t)\overrightarrow{r_u r_v}$ no existiria

Segons Hermite: $g_{12} = g_{21}$





$$y_1 = n.x_1 + q$$

$$y_2 = m.x_2 + p$$

$$\Delta x = \frac{y_2 - p}{m} - \frac{y_1 - q}{n}$$

$$\Delta y = y_2 - y_1$$

Quan hi apareix la variable temps, n_1= n+ v.t_0 i m_1= m+ v.t_0

O sigui: n= $v_1.t_n$ i m=$v_2.t_n$

$$\int dL = \int \sqrt{(\frac{y_2 - p}{m_1} - \frac{y_1 - q}{n_1})^2 . g_{11} + 2.\left(\frac{y_2 - p}{m_1} - \frac{y_1 - q}{n_1}\right)(y_2 - y_1).g_{12} + .(y_2 - y_1)^2 . g_{22}}$$

Si multipliquem i dividim per dt, on dt= $t_n - t_0$

$$\int \sqrt{(\frac{y_2 - p}{m_1} - \frac{y_1 - q}{n_1})^2 . g_{11} + 2.\left(\frac{y_2 - p}{m_1} - \frac{y_1 - q}{n_1}\right)(y_2 - y_1).g_{12} + .(y_2 - y_1)^2 . g_{22}}$$

$$\int \sqrt{(\frac{(\frac{y_2-p}{m_1}-\frac{y_1-q}{n_1})}{dt^2})^2 . g_{11} + 2.\left(\frac{(\frac{y_2-p}{m_1}-\frac{y_1-q}{n_1})}{dt^2}\right)(y_2-y_1).g_{12} + \left(\frac{(y_2-y_1)}{dt^2}\right)^2 . g_{22}} \text{ . dt}$$

$$\int dL = \int \sqrt{(\frac{[y_2n_1-pn_1-y_1m_1+qm_1]}{dt^2m_1n_1})^2 . g_{11} + 2.\left(\frac{[y_2n_1-pn_1-y_1m_1+qm_1]}{dt^2m_1n_1}\right).(y_2-y_1).g_{12} + \left(\frac{(y_2-y_1)}{dt^2}\right)^2 g_{22}} \text{ dt}$$

I usant les condicions inicials: valors de y_1 i y_2 i t_0 i t_n podrem deduïr L, suposant que t és la variable!!.