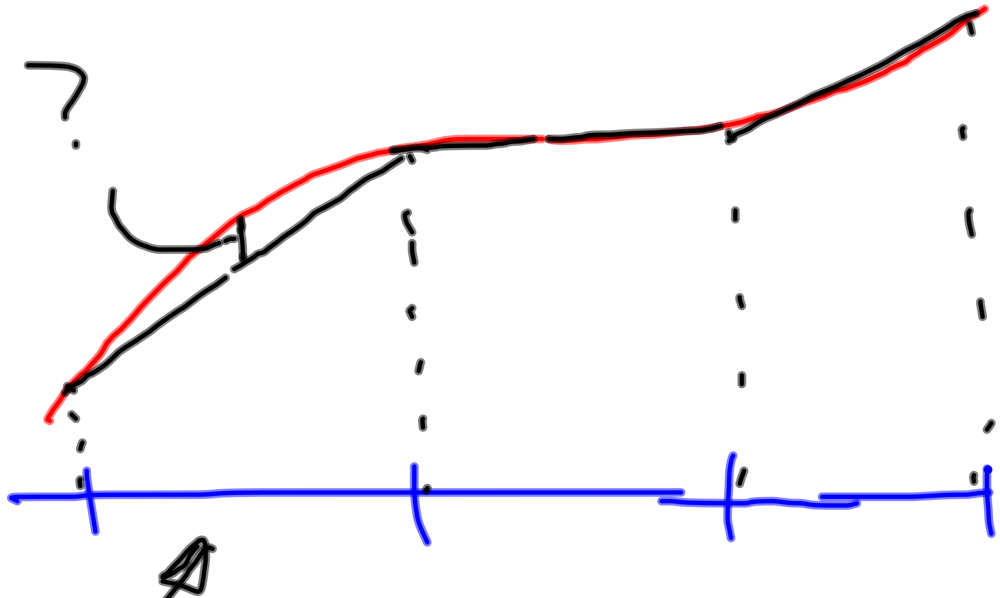
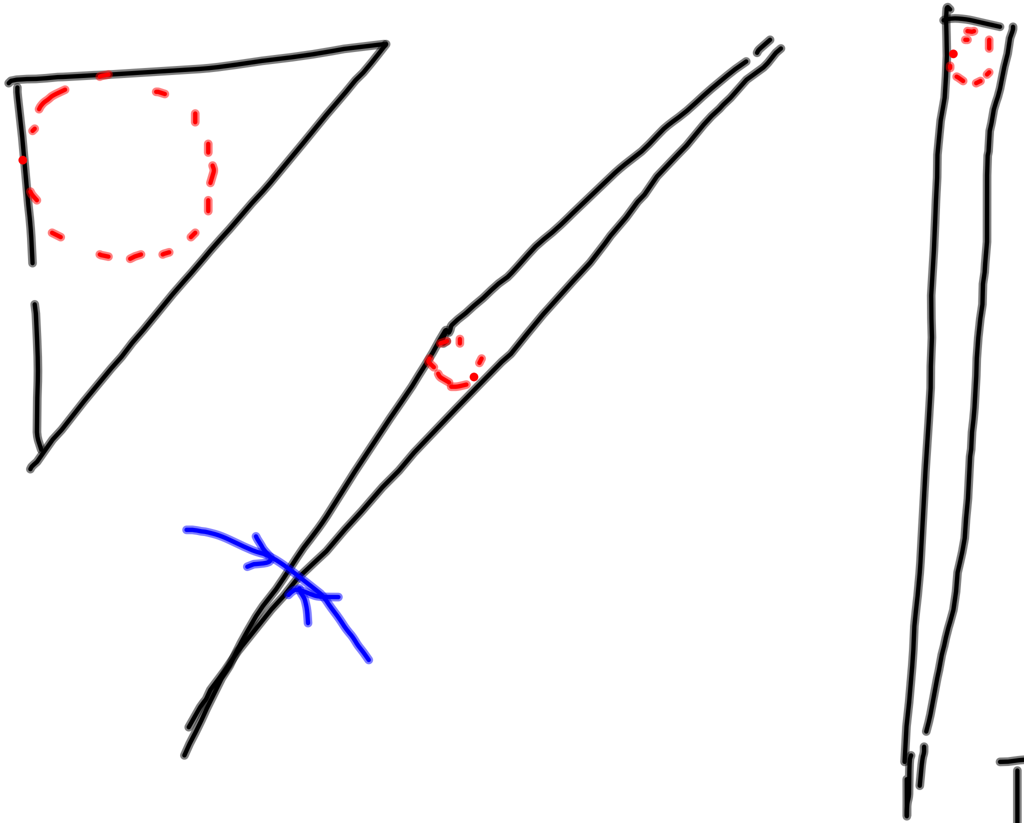
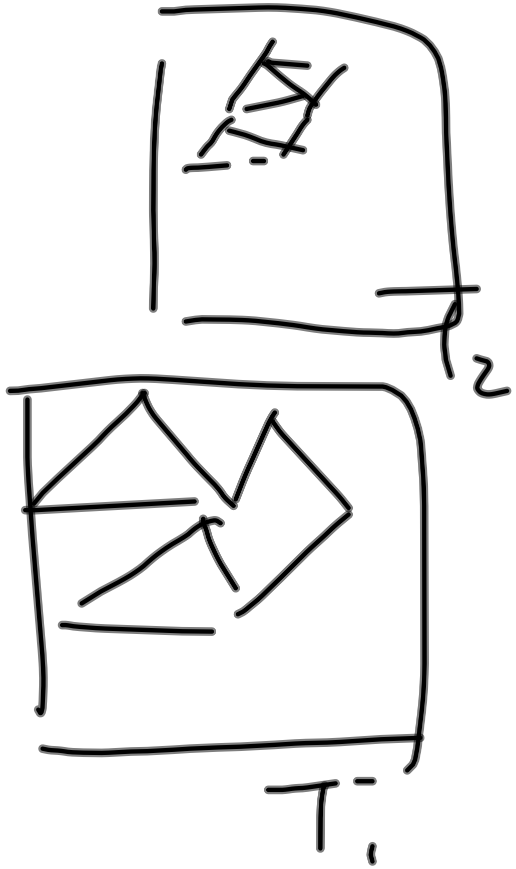


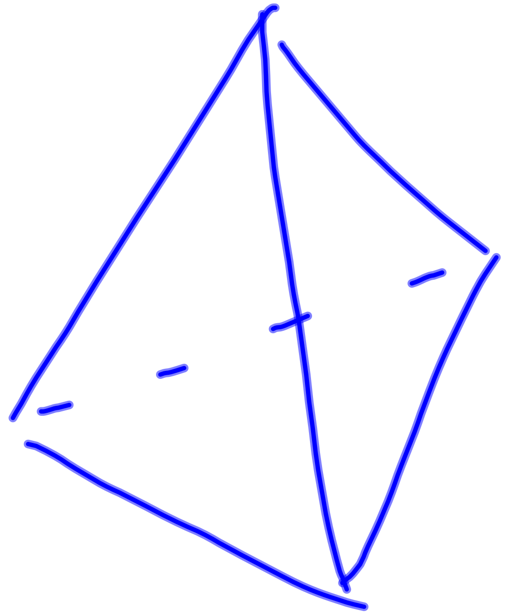
MIRAMOS UN ELEMENTO!





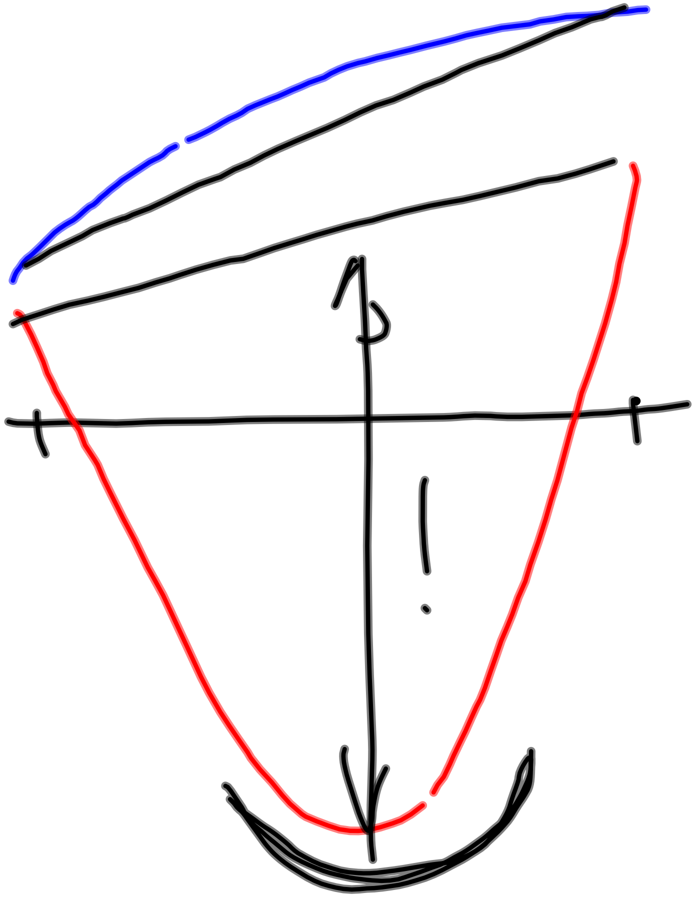
$$\frac{\rho_K}{h_K} \geq \cancel{\rho}$$

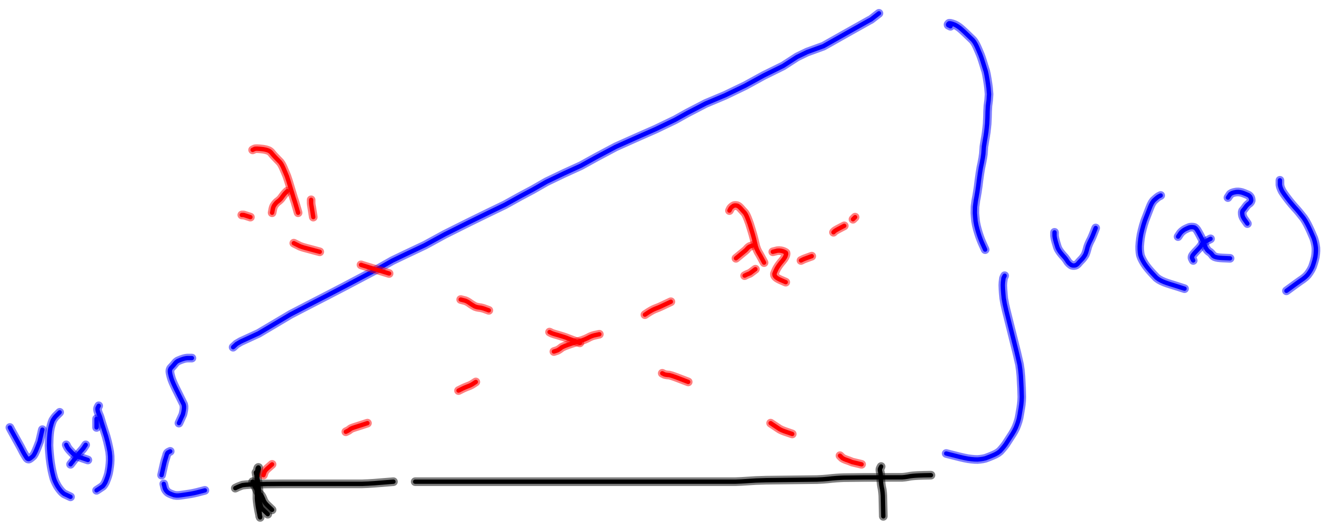
$$\Pi_h u(x^i) = u(x^i) \qquad i = 1, \dots 3$$



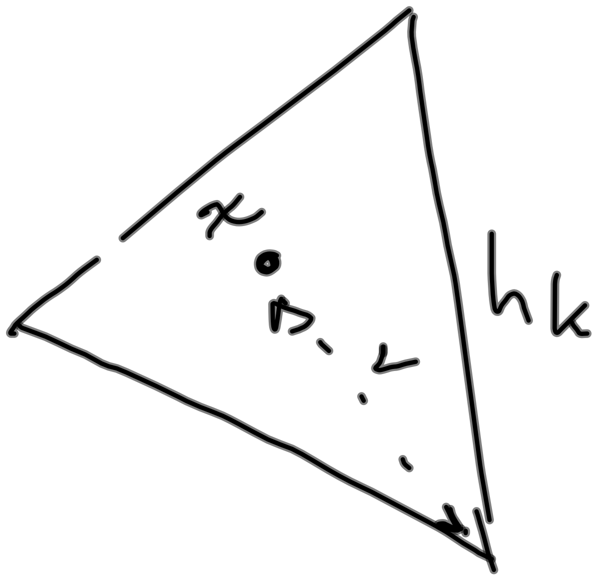
$$\Pi_h u(x^i) = u(x^i)$$

$$i = 1, \dots 4$$





$$v(x) = \lambda_1(x)\, v(x^1) + \lambda_2(x)\, v(x^2)$$



x
hk

$$v(x^i) = v(x) + \sum_{j=1}^{2} \frac{\partial v}{\partial x_j}(x)\,(x^i_j - x_j) + R(x, x^i)$$

$$\times\, \lambda_i(x) \qquad \times\, \lambda_i(x) \quad \underbrace{\sum_{j=1}^{2} \frac{\partial v}{\partial x_j}(x)\,(x^i_j - x_j)}_{p_i(x)} \qquad \underbrace{R(x,x^i)}_{R_i(x)}$$

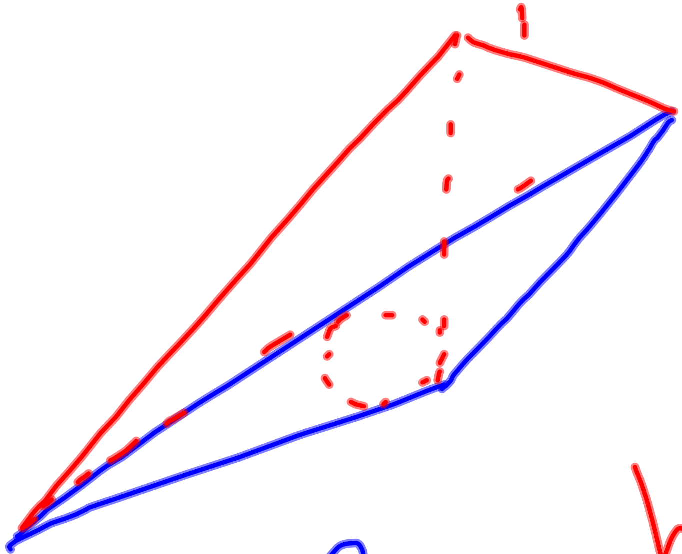
$$\underbrace{\sum_{i=1}^{3} \lambda_i(x)\, v(x^i)}_{\Pi\, v(x)} = \sum_{i=1}^{3} v(x)\,\lambda_i(x) + \sum_{i=1}^{3} p_i(x)\,\lambda_i(x) + \sum_{i=1}^{3} \lambda_i(x) R_i(x)$$

$$v(x) \underbrace{\cancel{\sum_{i=1}^{3} \lambda_i(x)}}_{1}$$

VEREMOS $\sum \lambda_i p_i = 0$

$$\frac{\partial}{\partial x_j} \pi v(x) = \sum \frac{\partial \lambda_i(x)}{\partial x_j} v(x^i) = \sum \frac{\partial \lambda_i}{\partial x_j} v(x) + \sum \frac{\partial \lambda_i}{\partial x_j} \rho_i + \sum \frac{\partial \lambda_i}{\partial x_j} R_i$$

$$v(x) + \rho_i(x) + R_i(x)$$

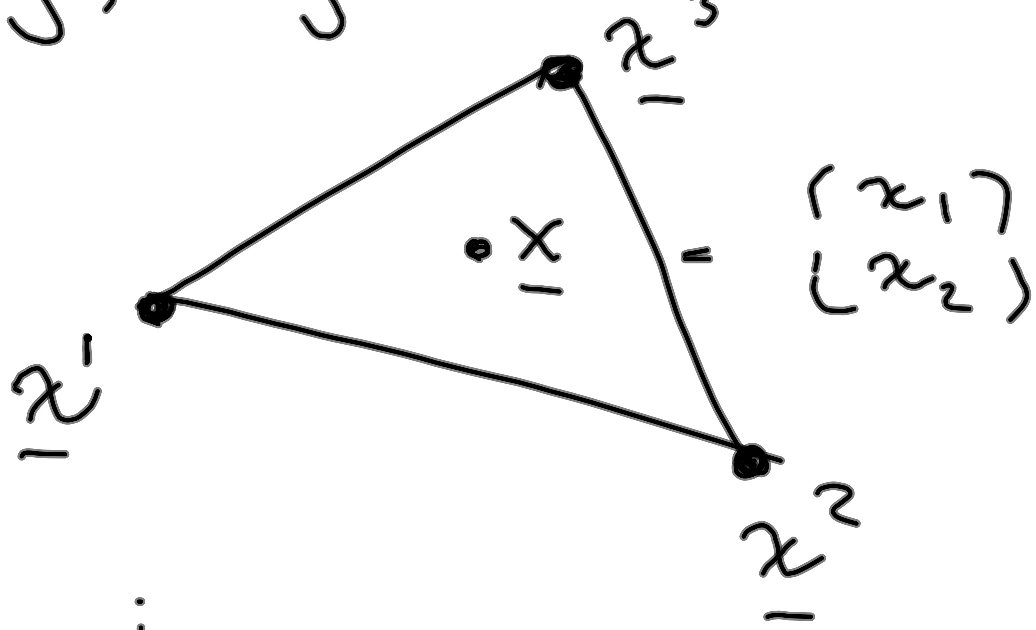


$P_1(K)$

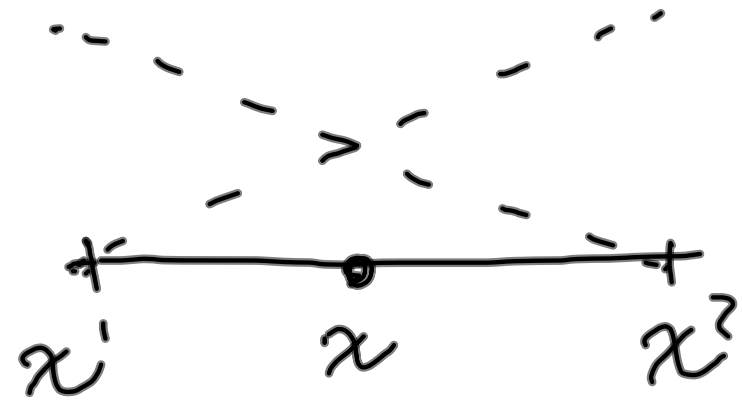
$$\frac{\partial \lambda_i}{\partial x_j} \text{ puede hacerse muy grande!}$$

$$\left| \frac{\partial v}{\partial x_j} - \frac{\partial \pi v}{\partial x_j} \right|$$

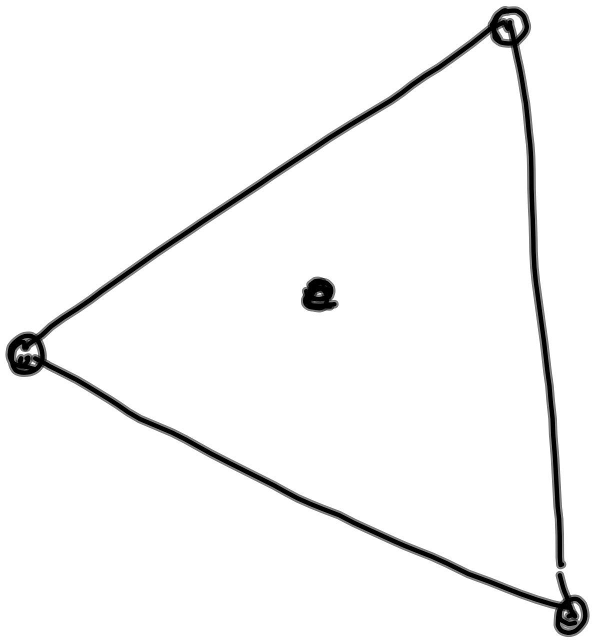
$$p_i(\underline{x}) = \sum_{j=1,2} \frac{\partial v}{\partial x_j}(\underline{x}) \left(x^i_j - x_j\right)$$

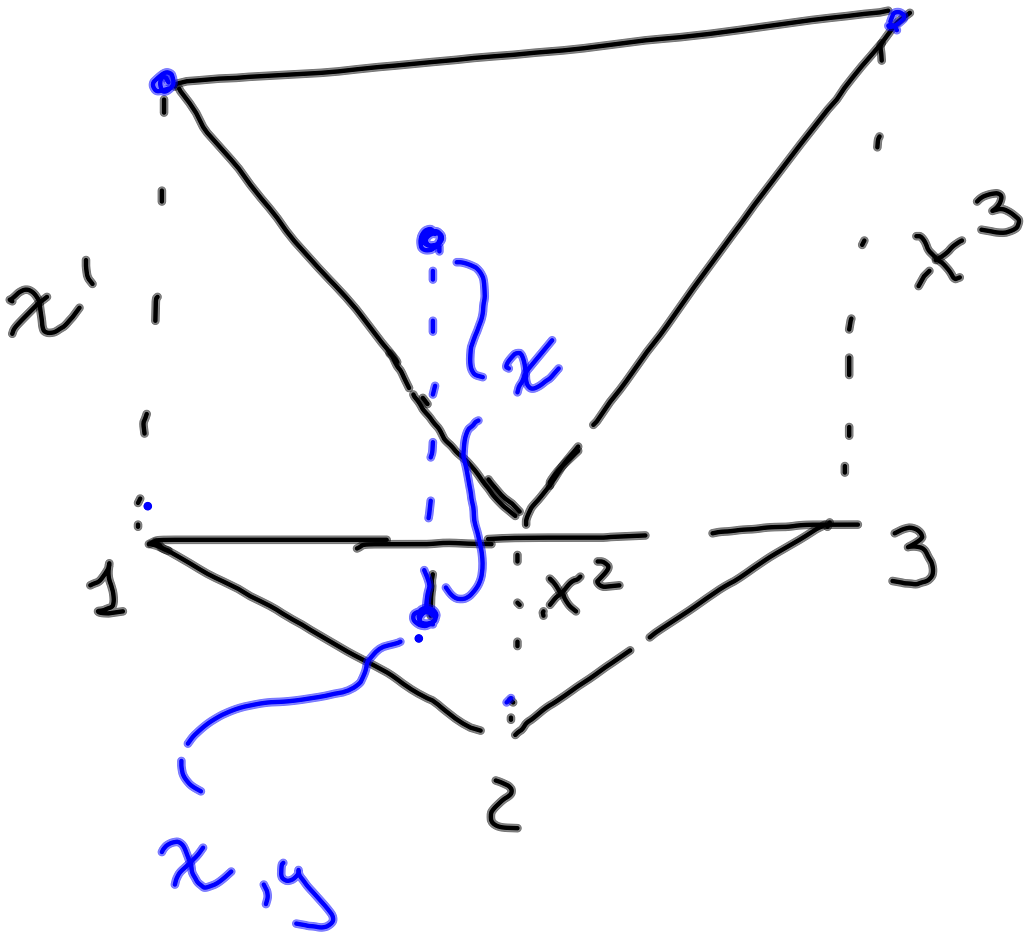


$$\underbrace{\sum \underbrace{\lambda_i(\underline{x})}\, x^i_j} = x_j$$



$$\sum \lambda_i(x)\, x^i$$

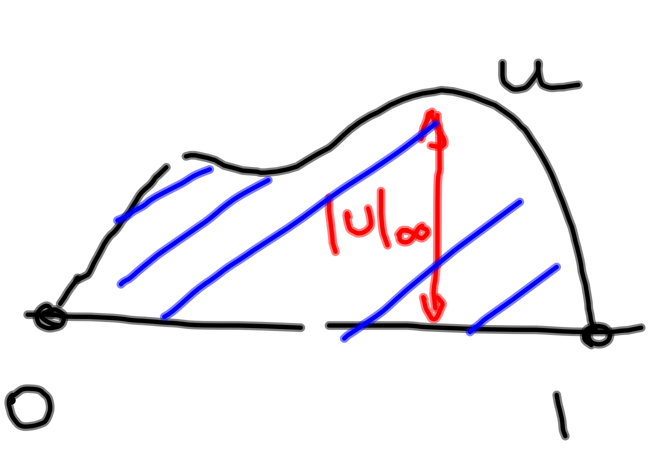



x^1
x^3
x
x^2
1
2
3
x, y

$$\lambda_i(x,y) = a_i + b_i x + c_i y$$

$$x = \lambda_1 x^1 + \lambda_2 x^2 + \lambda_3 x^3$$

Interp de coord ?

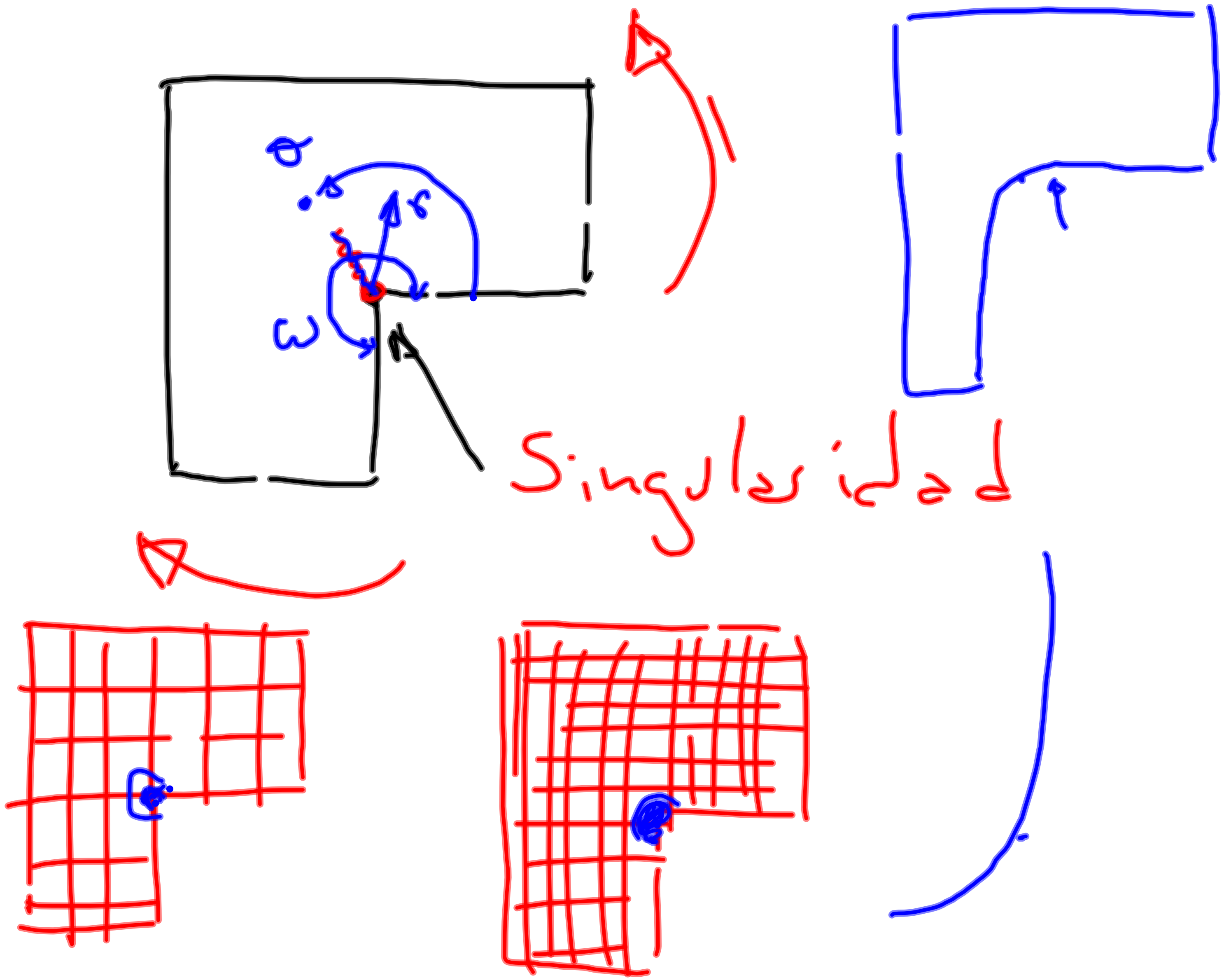


$$|u|_{L_\infty(I)} = \max_{x \in I} |u|$$

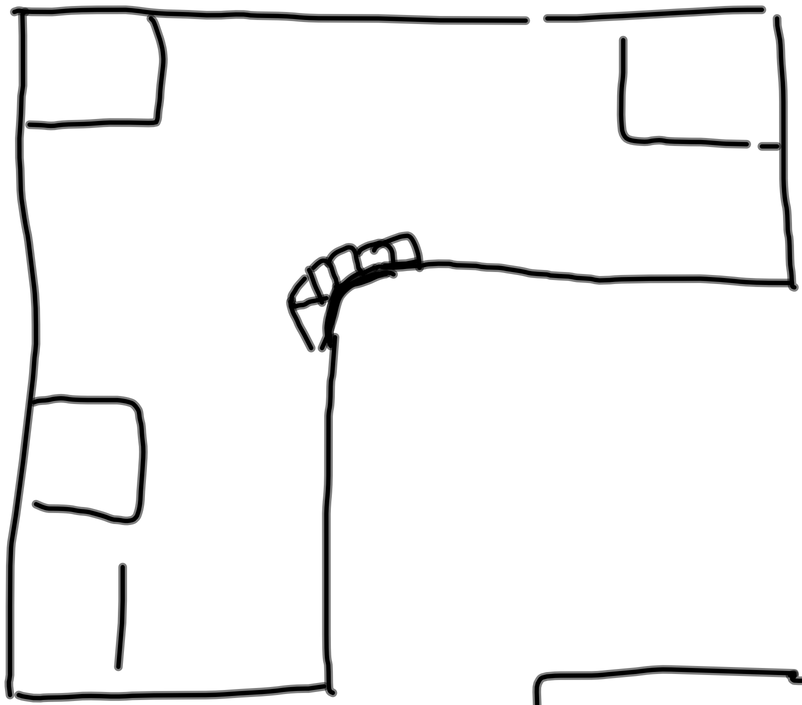
$$|u|_{L_2(I)} = \sqrt{\int_I u^2 \, dx}$$

Equiv de normes :

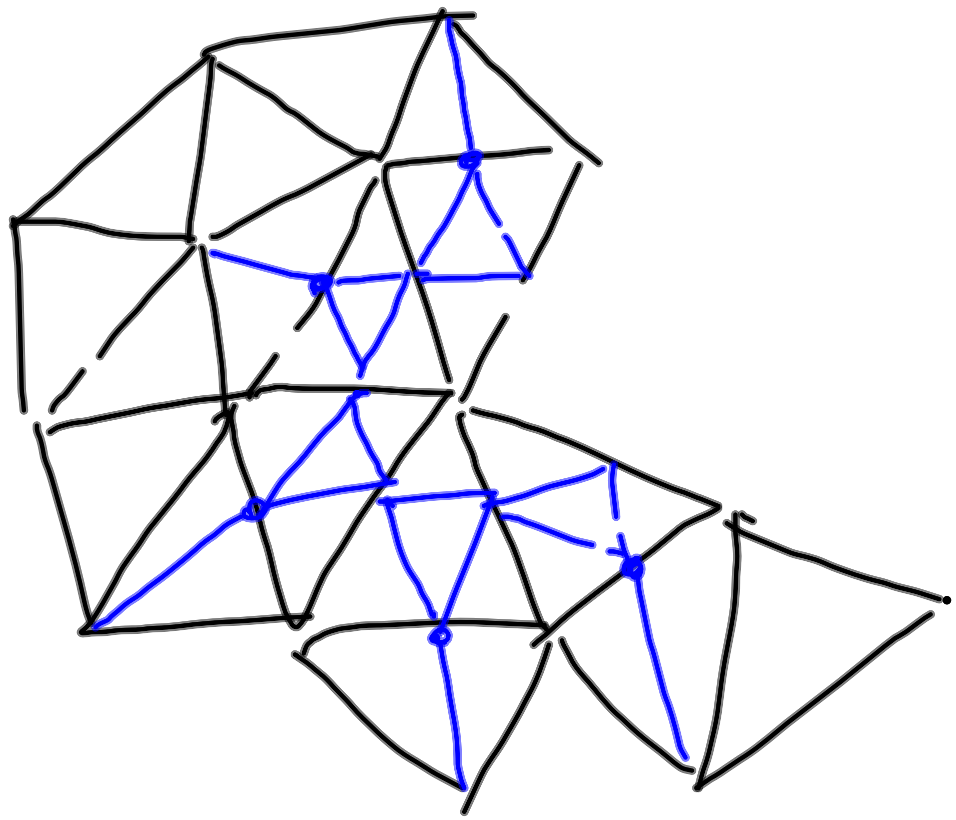
$$|u|_{L_\infty} \to 0 \Leftrightarrow \|u\|_{L_2} \to 0$$



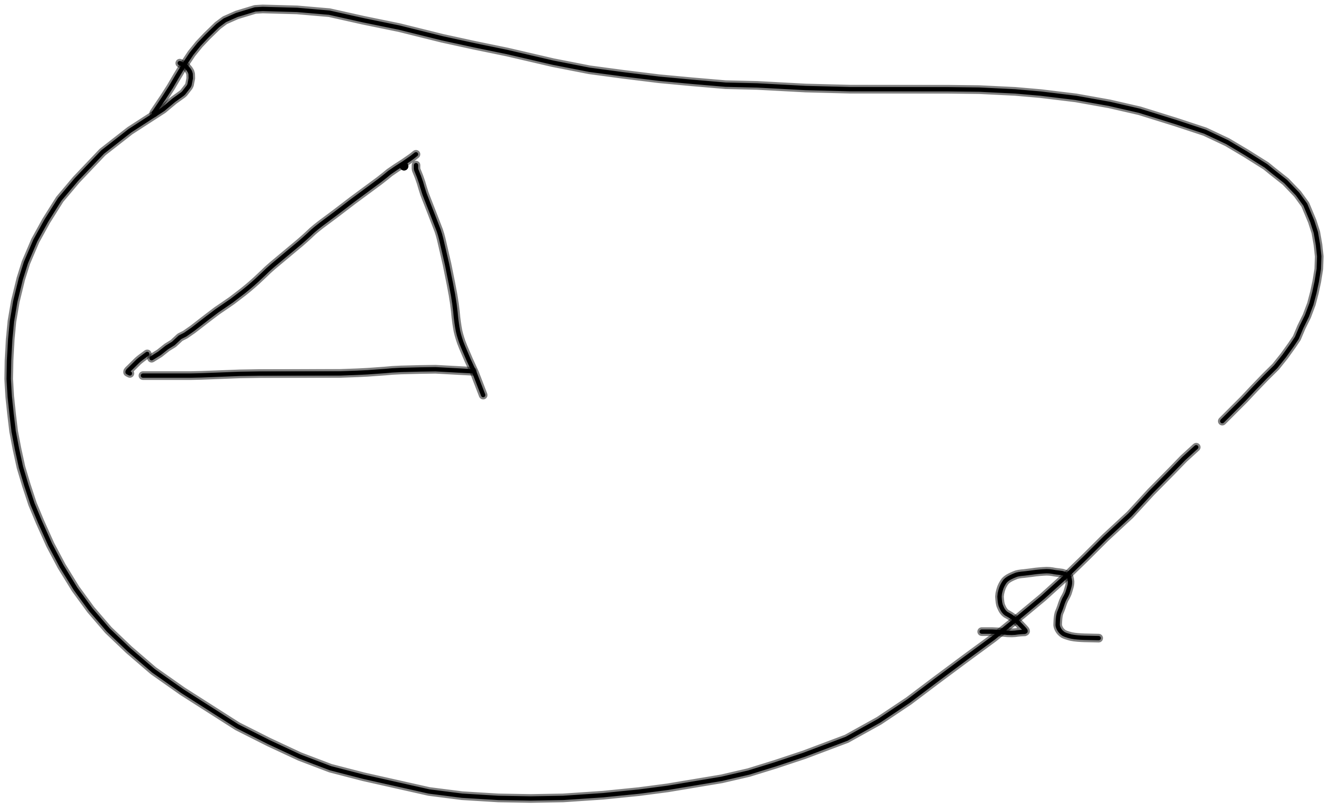
σ
r
ω
Singularidad



$$|u-u_h|_{H^1(\Omega)} \le C \sqrt{\sum_{K\in T_h} \left(h_K \, |u|_{H^2(K)} \right)^2}$$



$$\sum_{k=1,2} \frac{\partial v}{\partial x_k} \delta_{kj} = \frac{\partial v}{\partial x_j}$$



$$\|u - \pi_h u\|_{L_2(\Omega)}$$

$$\|u-\pi_h u\|_{L_2(\Omega)} \le C\, h^{r+1}\, |u|_{H^{r+1}(\Omega)}$$

$$|u-\pi_h u|_{H^1(\Omega)} \le C\, h^{r}\, |u|_{H^{r+1}(\Omega)}$$

Pol cuad: $r = 2$

$$\|u-\pi_h u\|_{L_2(\Omega)} \le C\, h^{3}\, \underline{|u|_{H^{3}(\Omega)}}$$

Debe estar acotado