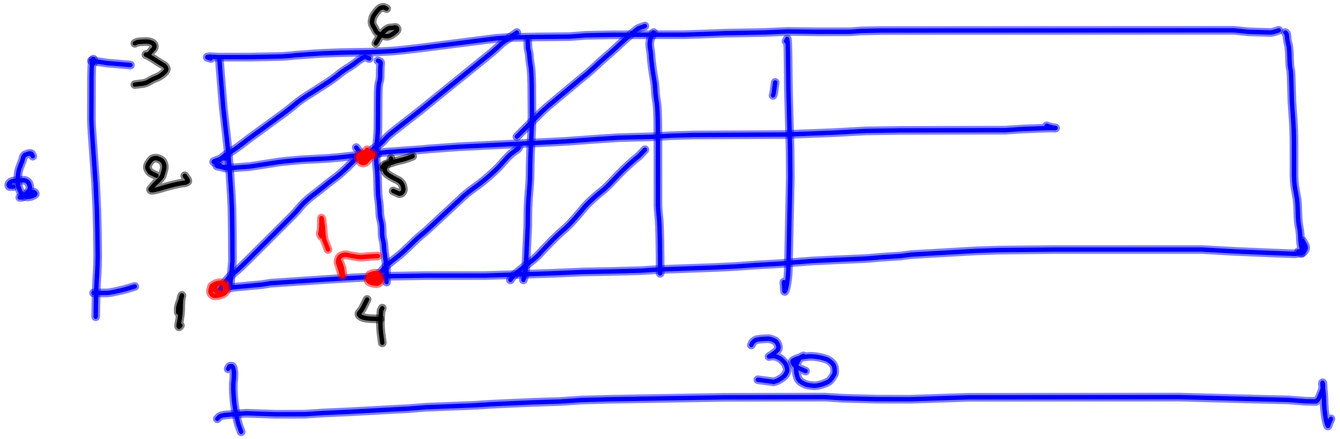

gen2d3n.m

lx, mx, ly, my

Nombre.

$$\int_\Omega \left[\frac{\partial}{\partial x}\left(k_x \frac{\partial\phi}{\partial x}\right) + \frac{\partial}{\partial y}\left(k_y\frac{\partial\phi}{\partial y}\right)\right] r\, d\Omega = \int_\Omega Q\, r\, d\Omega$$

Aplicando Green

$$\int_\Gamma \left(k_x n_x \frac{\partial\phi}{\partial x} + k_y n_y \frac{\partial \phi}{\partial y}\right) r\, ds - \int_\Omega \left(k_x\frac{\partial\phi}{\partial x} + k_y \frac{\partial\phi}{\partial y}\right) \nabla r$$

$$= \int_\Omega Q \cdot r\, d\Omega$$

$$\int_{\Gamma}\left(k_x m_x \frac{\partial \phi}{\partial x} + k_y m_y \frac{\partial \phi}{\partial y}\right) v = \cancel{\int_{\Gamma_\phi}\left(k_x m_x \frac{\partial \phi}{\partial x} + k_y m_y \frac{\partial \phi}{\partial y}\right) v}$$

$$\int_{\Gamma_q}\underbrace{\left(k_x m_x \frac{\partial \phi}{\partial x} + k_y m_y \frac{\partial \phi}{\partial y}\right)}_{-\bar{q}} v$$

$$v \in V = \left\{ v \in H^1_{(\Omega)} : v\Big|_{\Gamma_\phi} = 0 \right\}$$

$$\int_{\Gamma_{conv}}\underbrace{\left(k_x m_x \frac{\partial \phi}{\partial x} + k_y m_y \frac{\partial \phi}{\partial y}\right)}_{-h(\phi - \phi_{fl})} v$$

$$= -\int_{\Gamma_q} \bar{q} \cdot v \, d\Gamma - \int_{\Gamma_{conv.}} (h(\phi - \phi_{fl})) v \, d\Gamma$$

$$-\int_{\Gamma_{\bar{q}}} \bar{q}\, v \, d\Gamma - \int_{\Gamma_{conv}} \left(h(\phi - \phi_{fl})\right) \cdot v \, d\Gamma - \int_{\Omega} \left(k_x \frac{\partial \phi}{\partial x} + k_y \frac{\partial \phi}{\partial y}\right) \nabla v$$

$$= \int_{\Omega} Q \cdot v \, d\Omega$$

(V) Hallar $\phi \in V$ / $-\int_{\Gamma_q} \_\_\_ - \int_{\Gamma_{conv}} \_\_\_ - \int_{\Omega} \_\_\_ = \int_{\Omega} Q\, v$

funciones interpolación lineal (para 2D)

$a(\phi, r)$

$$\sum_{i=1}^{N} \Big(K_{ij} + \underbrace{\int_{\Gamma_{\text{conv}}} h\,\varphi_i \varphi_j \,ds}_{} \Big) \cdot \xi_i \qquad ,j = 1 \dots N$$

$$\delta K_{ij} = \text{delta} \left(k_x \beta_i \beta_j + k_y \gamma_i \gamma_j \right)$$

Matriz masa [2×2]

- $$M^e_{ij} = \int_{x_i}^{x_j} h\,\varphi_i \varphi_j \,ds \Rightarrow$$

$$M^e = \frac{h\,\|x_i - x_j\|}{6} \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}$$

$$M^e_{ij} = \frac{h\,(x_i - x_j)}{6} \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}$$

$$h(\phi - \phi_{fe})$$

$$\bar{\phi}$$

$$A \cdot \mu = b$$

$L(\Gamma)$

$Q = 0$

$h \; \phi_{fe} = cte$

- $f_{conv} = h \, \phi_{fe} \int_{\Gamma_{conv}} \varphi_j \, d\Gamma$

$q_m = \bar{q} \left(\frac{x_i + x_j}{2} \right)$

- $f_q = \int \bar{q} \, \varphi_j \, d\Gamma$

$$f_{conv} = \frac{h \, \phi_{fe} \, |x_j - x_i|}{2} \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

$$f_q = \frac{\bar{q}_m \, |x_j - x_i|}{2} \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$