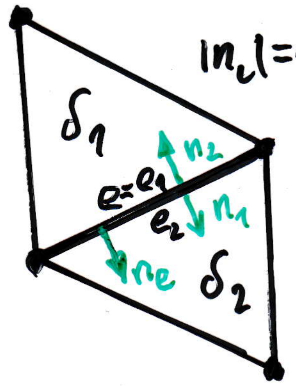
"Continuity" properties in the corresponding trace spaces:

- $u \in H^1(\Omega)$ are "continuous" across interfaces:

$$[u]_e := \underset{u|_{e_1}}{u_1} \cdot n_1 + \underset{u|_{e_2}}{u_2} n_2 = \underbrace{(u_1 - u_2)}_{[u]_e \cdot n_e \, \in H^{1/2}(e)} n_e = 0$$

$u_i = u|_{\delta_i}$

$|n_i| = 1$



- $\nabla u \in H(div) = H(div, \Omega)$, i.e. $\frac{\partial u}{\partial n} := \nabla u \cdot n$ is "continuous" across interfaces:

$$[\nabla u]_e := \nabla u_1 \cdot n_1 + \nabla u_2 \cdot n_2 = \underbrace{(\nabla u_1 - \nabla u_2) \cdot n_e}_{\in H^{-1/2}(e)} = 0 \quad !$$

$$\begin{matrix} u \in H^{s > 3/2}(\Omega) \\ u \in H^s(T_h) \end{matrix} \quad \underset{s > 3/2}{\xrightarrow{\text{Chapter 2}}} \quad \in L_2(e)$$