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$$H^1_{\text{loc}}$$

Definition. Local Sobolev space H^1_{loc}

Let $U \subseteq \mathbb{R}^n$ be open. The **local Sobolev space** of functions with derivatives in L^2_{loc}

$$H^1_{\text{loc}}(U) := \left\{ f \in L^2_{\text{loc}}(U) \mid \forall 1 \leq j \leq n, \partial_j f \in L^2_{\text{loc}}(U) \right\}$$

with norms

$$\|f\|_{H^1(\dot{K})}$$

for each compact $K \subseteq U$.

Definition.

$$H^1_{\text{loc}} \cap \mathcal{C}(U)$$

$\mathcal{C}^\infty(U)$ is dense in $H^1_{\text{loc}} \cap \mathcal{C}(U)$

Current note has 0 direct children and 0 total descendants.

- stem
 - subobjects of and functions on $\mathbb{R}^n, S^n, \mathbb{C}^n$ and its quotients $\Gamma \backslash \mathbb{R}^n, \Gamma \backslash \mathbb{C}^n$
 - Differentiable functions
 - Distributional derivatives
 - H^1_{loc}

And it has 4 siblings.

- stem
 - subobjects of and functions on $\mathbb{R}^n, S^n, \mathbb{C}^n$ and its quotients $\Gamma \backslash \mathbb{R}^n, \Gamma \backslash \mathbb{C}^n$
 - Differentiable functions
 - Distributional derivatives
 - Fractional Sobolev spaces
 - $H^1(U)$
 - H^1_{loc}
 - $H^1_{\text{loc}}(U)$ for $U \subseteq \mathbb{R}^2$