

Info

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Distributional derivatives

distributional derivatives of L^1_{loc} functions

Definition. Distributional derivatives of L^1_{loc} functions

Let $U(\text{open}) \subseteq \mathbb{R}^n$ be an open set and $f \in L^1_{\text{loc}}(U)$. Then $w \in L^1_{\text{loc}}$ is a **distributional derivative** of f in \hat{x}_j direction

$$\int \partial_j f = w \text{ if } \forall \varphi \in C_c^\infty(U), \int_U w \varphi = - \int_U f \partial_j \varphi$$

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 - [derivative](#) Differentiable functions
 - [dist](#) Distributional derivatives
 - [H-frac](#) Fractional Sobolev spaces
 - [H1](#) $H^1(U)$
 - [H1 loc](#) H^1_{loc}
 - [H1 loc R2](#) $H^1_{\text{loc}}(U)$ for $U \subseteq \mathbb{R}^2$

And it has 10 siblings.

- [stamp](#) stamp
 - [Rf](#) subobjects of and functions on $\mathbb{R}^n, T^n, S^n, \mathbb{C}^n$
 - [derivative](#) Differentiable functions

- [1 at a point](#) Functions $(a, b) \rightarrow \mathbb{R}$ differentiable at a point
- [bd](#) Comparing a function and its derivative
- [cont abs](#) Absolutely continuous functions on $[a, b] \leftrightarrow \int_{[a, -]}(L^1[a, b])$
- [dist](#) Distributional derivatives
- [double circle](#) Double derivative/Laplace operator on the circle
- [frac](#) Fractional derivative
- [limit infinite](#) Infinite limit of derivatives
- [space](#) Space of continuous and continuously differentiable functions on \mathbb{R}
- [total](#) Derivative of maps $\mathbb{R}^n \rightarrow \mathbb{R}^m$
- [zoom](#) Zooming of a map $\mathbb{R}^n \rightarrow \mathbb{R}^m$