



Math for the people, by the people.

locally integrable function

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Definition Suppose that U is an open set in \mathbb{R}^n , and $f: U \rightarrow \mathbb{C}$ is a Lebesgue measurable function. If the Lebesgue integral

$$\int_K |f| dx$$

is finite for all compact subsets K in U , then f is *locally integrable*. The set of all such functions is denoted by $L^1_{\text{loc}}(U)$.

Example

1. $L^1(U) \subset L^1_{\text{loc}}(U)$, where $L^1(U)$ is the set of (globally) integrable functions.
2. Continuous functions are locally integrable.
3. The function $f(x) = 1/x$ for $x \neq 0$ and $f(0) = 0$ is not locally integrable.