



## Real Integral Limit Inferior Bound

### 1 Why

TODO

### 2 Result

**Proposition 1.** *The integral of the limit inferior of a sequence of measurable, nonnegative, extended-real-valued functions is no larger than the limit inferior of the sequence of integrals.*

*Proof.* Let  $(X, \mathcal{A}, \mu)$  be a measure space, and let  $f_n : X \rightarrow [0, \infty]$  a  $\mathcal{A}$ -measurable function for every natural number  $n$ . We want to show that if

$$\int \liminf_n f_n d\mu \leq \liminf_n \int f_n d\mu.$$

□