
Section 2.6: 2 (optional)

2. **(Optional)** Let $1 \leq p < \infty$, and let $f_n \in L^p(\Omega)$ for $n \geq 1$, and $f \in L^p(\Omega)$. Suppose that $f_n \rightarrow f$ pointwise almost everywhere, and $\|f_n\|_{L^p(\Omega)} \rightarrow \|f\|_{L^p(\Omega)}$, as $n \rightarrow \infty$. Show that $\|f_n - f\|_{L^p(\Omega)} \rightarrow 0$ as $n \rightarrow \infty$.