

Problem

Suppose that $f : [a, b] \rightarrow \mathbb{C}$ is integrable. Prove that for every $\epsilon > 0$ there exists $\delta > 0$ such that for any measurable subset $A \subset [a, b]$ with $|A| < \delta$ we have $\int_A |f| < \epsilon$. Can you relate this to the notion of AC?

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