

L^r norm exists, then the L^s norm also exists. For, if $\sum a_i^r$ converges, then there exists some natural number N such that $a_j^r < 1$ for every $j \geq N$. But then, $a_j^s < a_j^r$ for every $j \geq N$, so by the comparison test on sequences, $\sum a_i^s$ also exists. Thus, $L^r \subset L^s$, as required. Finding conditions for either inclusion was already established in previous problems - in 2(a), the argument given establishes that if $\mu(X) < \infty$, then $r < s$ implies $L^r \supset L^s$. In 2(b), we proved that the "minimum measure" condition enforces inclusion in the other direction. ■