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Q: Why Claim is true ?

Thm 2.7.4 Comparison Test

Assume a_k and b_k are sequences satisfying $0 \le a_k \le b_k$ for $\forall k \in \mathbb{N}$

i) if $\sum_{k=1}^{\infty} b_k$ converges, then $\sum_{k=1}^{\infty} a_k$ converges

ii) if $\sum_{k=1}^{\infty} a_k$ diverges, then $\sum_{k=1}^{\infty} b_k$ diverges