

June 2005 AMS 504 Questions

1. Let f be a continuous function on $[0,1]$. Evaluate the limit as $n \rightarrow \infty$ of $\int x^n f(x) dx$.
2. Given c and x such that $0 < c \leq 1$ and $x > -1$, prove that $(1+x)^c \leq 1 + cx$.
3. Let X be a metric space, and let $K \subset X$ be compact. Prove that K' , the set consisting of limit points of K , is compact.