Rec 10/8

Tuesday, October 8, 2019 10:33

Chebyshev's Ineq.

$f \in L^+(\mu)$ (any). $\forall M > 0$, $\mu(\{f > M\}) \leq \frac{1}{M} \int f \, d\mu$

Borel-Cantelli Lemma

$(\mathbb{R}, \lambda)$

Let $\{E_k\}_1^\infty$ be a countable collection of mble sets for which $\sum_1^\infty \lambda(E_k) < \infty$.

Then almost all points in $\mathbb{R}$ belong to at most finitely many of the E_k's.

(i.e. $\lambda(\limsup E_k) = 0$).

Pf $\lambda(\limsup E_k) = \lambda\left(\bigcap_1^\infty \bigcup_k^\infty E_n\right) \leq \lambda\left(\bigcup_k^\infty E_n\right) \leq \sum_1^\infty \lambda(E_k) \longrightarrow 0$ as $k \to \infty$.

Note: Could have been any measure.

Prob measure $P(X) = 1$.

Independent Events: $P(E \cap F) = P(E)\,P(F)$

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