Convergence of random variables

Warm-up

Suppose that $X_1, X_2, \ldots \overset{iid}{\sim} Uniform(0, 1)$. Let $X_{(n)} = \max\{X_1, \ldots, X_n\}$.

> Working with a neighbor, argue that $X_{(n)} \overset{p}{\to} 1$.

Warm-up

Suppose that $X_1, X_2, \ldots \overset{iid}{\sim} Uniform(0, 1)$. Let $X_{(n)} = \max\{X_1, \ldots, X_n\}$.

Show that $n(1 - X_{(n)}) \overset{d}{\to} Y$, where $Y \sim Exp(1)$.

Relationships between types of convergence

Continuous mapping theorem

Slutsky's theorem