Activity: Convergence in probability

Convergence in probability

1. Suppose that $X_1, X_2, ... \overset{iid}{\sim} Uniform(0,1)$, and let $X_{(n)} = \max\{X_1, ..., X_n\}$. Show that $X_{(n)} \xrightarrow{p} 1$.

2. Suppose that $X_1, X_2, ... \overset{iid}{\sim} Exponential(1)$, with pdf $f(x) = e^{-x}$. Let $Y_n = \min\{X_1, ..., X_n\}$, and from HW 2 we know that $Y_n \sim Exponential(n)$, with pdf $f(y) = ne^{-ny}$. Show that $Y_n \overset{p}{\to} 0$.