STAT/MA 41600
Practice Problems: December 5, 2014

1. Consider X_1, X_2, X_3, X_4 which are independent and uniformly distributed on $[0, 20]$.
a. Find the density of the first order statistic, i.e., find $f_{X_{(1)}}(x_1)$.

b. Find the density of the second order statistic, i.e., find $f_{X_{(2)}}(x_2)$.

2. Same setup as Question #1.
a. Find the expected value of the first order statistic, i.e., find $\mathbb{E}(X_{(1)})$.

b. Find the expected value of the second order statistic, i.e., find $\mathbb{E}(X_{(2)})$.

3. Let X_1 and X_2 be the waiting times for Alice and Bob until their respective phones ring. Assume that X_1, X_2 are independent exponentials, each with mean 10.

a. Find the density of the first order statistic, $X_{(1)}$, i.e., find $f_{X_{(1)}}(x_1)$.

b. Find the density of the second order statistic, $X_{(2)}$, i.e., find $f_{X_{(2)}}(x_2)$.

4. Same setup as Question #3.
a. Find the expected value of the first order statistic, i.e., find $\mathbb{E}(X_{(1)})$.

b. Find the expected value of the second order statistic, i.e., find $\mathbb{E}(X_{(2)})$.

5. Let X_1, X_2 be independent, identically distributed, each with density $f_X(x) = 6(x - x^2)$ for $0 < x < 1$, and $f_X(x) = 0$ otherwise.

a. Find the density of the first order statistic, $X_{(1)}$.

b. Find the expected value of the first order statistic, i.e., find $\mathbb{E}(X_{(1)})$.