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 $\mathbb{E}(X_{(1)})$. 