

## Math 262

### Section 4.9

Day 25

1. Let  $X_1$  and  $X_2$  be iid  $\text{Exp}\left(\frac{1}{10}\right)$ .

(a) What is the pdf of  $Y_1 = \min(X_1, X_2)$ ?

(b) What is the expected value of  $Y_1$ ?

(c) What is the pdf of  $Y_2 = \max(X_1, X_2)$ ? What is  $E(Y_2)$ ?

2. Let  $X_1, X_2, X_3$  be iid  $\text{Exp}\left(\frac{1}{10}\right)$ . What is the expected value of the sample median?

3. Let  $X_1, X_2, X_3$  be iid  $\text{Unif}[0, 1]$ . What is the probability that the sample median is between  $\frac{1}{4}$  and  $\frac{3}{4}$ ?
4. Let  $n$  be a positive odd integer and let  $X_1, X_2, \dots, X_n$  be iid  $\text{Unif}[0, 1]$ . What is the smallest  $n$  such that the sample median is between 0.4 and 0.6 with probability greater than  $\frac{1}{2}$ ?
5. Let  $X_1, \dots, X_8$  be iid  $\text{Unif}[0, 1]$ .
- (a) Make a plot of the pdfs of all eight order statistics.
- (b) What are the expected values of all eight order statistics?