

Math 477, Worksheet for lecture 21

Name: _____

Net ID: _____

1. Suppose a fair coin is flipped n times. Let X be the number of times in the sequence that two heads occur in a row. What is the expected value of X (For example, the sequence $HTHHHTH$ would have $X = 2$, the sequence $HTHHTHHT$ would have $X = 2$ and the sequence $HTHHHHTT$ would have $X = 3$).

2. Let X, Y be jointly continuous random variables with joint density function given by

$$f(x, y) = \begin{cases} Cxe^{-xy} & x, y > 2 \\ 0 & \text{otherwise} \end{cases}$$

(a) Find the constant C

(b) Find the expected value of Y/X .

3. Suppose that we have a group of 3 children, whose age is between 1 and 6. We assign them each a number from 1 to 6 so that no two children get the same number. Let X be the number of children who are assigned their age.

(a) What is the expected value for X if no two children have the same age?

(b) What is the expected value for X if all children have the same age?

(c) What is the expected value for X assuming no information about the children's age?