SSIE 660: Stochastic Systems

Homework assignment 1

Sep. 2nd, 2016
Due: Sep 12th, 2016, Before class starts

1. An interval of length 1, say (0,1), is divided into three segments by choosing two points at random. What is the probability that the three line segments form a triangle?
(Hint: triangle $\rightarrow$ any segment $<$ the sum of the other two segments).

2. Find the probability that the sum of two randomly selected positive numbers, both ≤ 1, will not exceed 1 and that their product will not exceed $1/4$.

3. In a class there are four freshman boys, six freshman girls, and six sophomore boys. How many sophomore girls must be present if gender and class are to be independent when a student is selected at random?

4. Suppose that we have ten coins such that if the i^{th} if flipped, then heads will appear with probability $i/10, i = 1, 2, ..., 10$. When one of the coins is randomly selected and flipped, it shows heads. What is the probability that it was the fifth coin?

5. An urn contains b black balls and r red balls. One of the balls is drawn at random, but when it is put back in the urn, c additional balls of the same color are put with it. Now suppose that we draw another ball. Show that the probability that the first ball drawn is black, given that the second ball drawn was red is

$$\frac{b}{b+r+c}$$