

Practice Test One, Math 477, Oct. 16, 2018

October 15, 2018

NAME: _____

Circle problems to be graded: 1 2 3 4 5

1.	
2.	
3.	
4.	
5.	
Total	

1. 10 balls are randomly placed into 3 urns, That is, the 10 balls are placed, one after another, independently, and with equal probability, into one of the 3 urns. What is the probability that every urn is occupied?

2. Suppose that 5 men out of 100 are colorblind, and 25 women out of 10,000 are colorblind. Assume half the population is male and half is female. A person selected at random from the population turns out to be colorblind. What is the probability that this person is male?

3. An urn initially contains 5 white balls and 7 black balls. Each time a ball is selected, its color is noted and it is replaced in the urn along with two other balls of the same color. What is the probability that of the first 4 balls selected, exactly 2 are black?

4. Urn A contains 5 white balls out of 7 total balls, the rest black Urn B contains 3 white balls out of 12 total balls, the rest black. We flip a fair coin, and if the outcome is heads, we select a ball from urn A, while if the outcome is tails, we select a ball from urn B. Suppose a white ball is selected.

What is the probability that result of the coin toss was heads? Define a random variable X to have the value 1 if the selected ball is white, and to have the value 2 if the selected ball is black. Compute the mean and variance of X

5. Toss a fair coin m times. Let X denote the number of heads minus the number of tails. Compute $E(X)$ and $\text{Var}(X)$.