

CSC 231 HOMEWORK 5

PROFESSOR GODFREY C. MUGANDA

Due Date: Friday of Week 7

Do the following problems. Make sure you show your work and the reasoning used to arrive at the solutions.

1. A bucket contains 15 balls, exactly 3 of which are red. Maria chooses 4 balls at random. What is the probability that none of the balls chosen are red?
2. There are five red balls and four white balls in a box. Four balls are selected at random from these balls. Find the probability that two of the selected balls will be red and two will be white.
3. Let A and B be independent events. If $P(A) = .7$ and $P(B) = .6$, find $P(B | A)$.
4. Six balls are numbered. The numbers are 0, 1, 1, 2, 5, and 10, respectively. The balls are placed in an urn and one is randomly selected. A player receives n dollars if the number on the ball selected is n . What is the expected value of the amount won?
5. Eight balls are numbered. The numbers are 0, 1, 1, 2, 2, 2, 5, and 10, respectively. The balls are placed in an urn and three are randomly selected. The player receives the amount in dollars of the sum of the three balls. What is the expected value of the amount won?

Problem 5 requires more work than the other problems, so is worth twice as many points.

6. If 10% of a product made is defective, what is the probability that if 10 samples are selected, exactly two are defective?

You can show the formula used to produce the answer, but you do not have to work the answer out as a number.

7. If ten cards are selected sequentially from a deck of cards without replacement, what is the probability that exactly two of them are hearts?
8. A company manufactures tires in three plants. Forty five percent of the tires are manufactured in plant A , 25 percent are manufactured in plant B , and 30% are manufactured in plant C . Suppose that 5% of the tires manufactured in plant A are defective, 10 % of the tires manufactured in plant B are defective, and 2% of the tires manufactured in plant C are defective. If a tire is purchased and found to be defective, what is the probability that it was manufactured in plant B ?
9. A box contains three coins. One has two heads, one is a fair coin, and the other comes up heads 70% of the time. A coin is selected at random and tossed. If it comes up heads, what is the probability that it was the fair coin?