**ASSIGNMENT 3**

1. Assume that each child who is born is equally likely to be a boy or a girl. If a family has two children, what is the probability that both are girls given that
2. the eldest is a girl
3. at least one is a girl
4. Suppose that 5 percent of men and 0.25 percent of women are color- blind. A color- blind person is chosen at random. What is the probability of this person being male? Assume that there are an equal number of males and females.
5. Bill and George go target shooting together. Both shoot at a target at the same time. Suppose Bill hits the target with probability 0.7, whereas George, in-dependently, hits the target with probability 0.4.
6. Given that exactly one shot hit the target, what is the probability that it was George’s shot?
7. Given that the target is hit, what is the probability that George hit it?
8. What is the conditional probability that the first die is six given that the sum of the dice is seven?
9. In a class there are four freshman boys, six freshman girls, and six sophomore boys. How many sophomore girls must be present if sex and class are to be independent when a student is selected at random?
10. Consider two boxes, one containing one black and one white marble, the other, two black and one white marble. A box is selected at random and a marble is drawn at random from the selected box. What is the probability that the marble is black? What is the probability that the first box was the one selected given that the marble is white?
11. Urn 1 contains two white balls and one black ball, while urn 2 contains one white ball and five black balls. One ball is drawn at random from urn 1 and placed in urn 2. A ball is then drawn from urn 2. It happens to be white. What is the probability that the transferred ball was white?
12. Stores A, B, and C have 50, 75, and 100 employees, and, respectively, 50, 60, and 70 percent of these are women. Resignations are equally likely among all employees, regardless of sex. One employee resigns and this is a woman. What is the probability that she works in store C?
13. (a) A gambler has in his pocket a fair coin and a two- headed coin. He selects one of the coins at random, and when he flips it, it shows heads. What is the probability that it is the fair coin? (b) Suppose that he flips the same coin a second time and again it shows heads. Now what is the probability that it is the fair coin? (c) Suppose that he flips the same coin a third time and it shows tails. Now what is the probability that it is the fair coin?
14. Urn 1 has five white and seven black balls. Urn 2 has three white and twelve black balls. We flip a fair coin. If the outcome is heads, then a ball from urn 1 is selected, while if the outcome is tails, then a ball from urn 2 is selected. Suppose that a white ball is selected. What is the probability that the coin landed tails?