Homework 5: Discrete Random Variables

1. §3.1, #2, 3.

2. An urn contains seven balls numbered 1 to 7. Two balls are drawn simultaneously. Let X be the larger of the two numbers drawn. Find $f_X(x)$.

3. A fair die is tossed three times. Let X be the number of different faces that appear. Find $f_X(x)$.

4. Two dice are rolled. Let X be the product of the two dice. Find $f_X(x)$.

5. Suppose that five people, including you and a friend, line up at random. Let the random variable X denote the number of people standing between you and your friend. What is $f_X(x)$?

6. Five men and five women are ranked according to their scores on an examination. Assume that no two scores are alike and all 10! possible rankings are equally likely. Let X denote the highest ranking achieved by a woman. (For instance, $X = 1$ if the top-ranked person is a woman.) Find $f_X(x)$.

7. Let X be the difference between the number of heads and the number of tails when a coin is tossed n times. What are the possible values of X?

8. An elementary school has 3 sixth-grade classes, each consisting of 20 students. From these 60 sixth-grade students, a committee of 3 students is selected at random. Let the random variable X be the number of different classes the three committee members are from. (For example, $X = 3$ if the committee members are all from different classes.) What are the different values X can take? Find the probability function of X.