

Worksheet 7.2 and 7.3

Max's Lecture
MATH 55

July 19, 2019

Exercise A: Example 2 in 7.3. Suppose that a die is biased so that 3 appears twice as often as each other number but all other options are equally likely. What is the probability that an odd number appears when we roll the dice?

Exercise S. Suppose we flip a coin three times, and all 8 possibilities are equally likely. Suppose we know that the event F , that the first coin comes up tails, occurs. Given this information, what is the probability of the event E , that an odd number of tails appears?

Exercise C (example in book). Assume that each of the four ways a family can have 2 children is equally likely. Are the events E , that a family with two children has two boys, and F , that a family with two children has at least one boy, independent?

Exercise D (example in book). Suppose 1 person in 100,000 has a particular rare disease for which there is a fairly accurate diagnostic test. This test is correct 99 percent of the time when given to a person who has the disease, and it is correct 99.5 percent of the time when given to a person at random who does not have the disease.

Given this information, can we find:

1. the probability that a person who tests positive for the disease has the disease?
2. the probability that a person who tests negative for the disease really does not have the disease?

Exercise E.

Prove that the binomial distribution for a given n, p defined in class actually is a probability distribution.