

# Solutions & Homework 3

Anton Lykov

October 19, 2019

## 1 Solutions

### Problem 2.

Calculate the probability of flipping a fair coin three times and getting 2H and 1T

- a) In this order
- b) In any order

### Solution 2.

The sample space in this problem looks like this:

$$\Omega = \{HHH, HHT, HTH, THH, HTT, THT, TTH, TTT\}$$

where TTH, for instance, means that the first 2 flips were tails, and last one was heads. The probability of each of these elementary events is  $\frac{1}{8}$ .

- a) The corresponding event is {HHT}, and so the probability is  $\frac{1}{8}$
- b) The corresponding event is {HHT, HTH, THH}, and so the probability is  $\frac{3}{8}$ .

### Problem 4.

Calculate the probability of rolling a six-sided die three times and getting a sum of three outcomes equal to 10.

### Solution 4.

There are  $6^3$  possible elementary outcomes total, each one equally likely. We need to calculate how many of these outcomes belong to event  $E = \{\text{sum of three rolls is } 10\}$ , i.e. how many ways there are to represent 10 as a sum of three integers from 1 to 6. There are 27 ways of doing so, and thus the answer is  $\frac{27}{6^3}$ .

## 2 Homework

### Problem 1.

- a) Given a random 2-digit integer, what is the probability that the sum of its digits is equal to 9?
- b) The same question, but you additionally know that each digit is at least 3.

### Problem 2.

Suppose there are three cards. One card is red on both sides, one is green on both sides, and one has a side of each color. Suppose one card is chosen at random (i.e. blindly out of a bag). You are able to see that one side of the card is red. What is the probability that the other side of the card is also red?