Grade 9/10 Math Circles
March 27, 2024
Probability II - Problem Set

In-Lesson Exercises

1. Suppose you roll a six-sided die twice. Find the probability that you roll:

   (a) an even number followed by an odd number

   (b) a 1 followed by any other number

2. Suppose there are 2 red balls, 3 green balls, and 5 blue balls in a bin. You randomly choose two balls, replacing the first before drawing another. Find the probability that:

   (a) the first ball is red and the second is green

   (b) both balls are blue

3. Suppose you roll two six-sided dice. What is the probability that their sum is at least 10 given that you rolled doubles?

4. Suppose B is a subset of A. What is $P(A|B)$?

5. Suppose you have a bin with 6 black socks, 10 red socks, and 4 white socks. If you select two socks from the bin, how likely are you to get a matching pair?

6. Many people who like board games also like video games. Suppose 70% of people play board games, and of those people 50% also play video games. Only 20% of people who don't play board games play video games. How likely is a random person to play video games?

7. Suppose that 80% of people like cookies, 40% of people like brownies, and 90% of people who like brownies also like cookies. If your friend tells you that they like cookies, how likely is it that they also like brownies?