Lesson 4.6.1: Basic Concepts of Probability

Probability: a measure that is associated with how certain we are of outcomes of a particular experiment or activity
Chance Experiment: an activity which can be repeated over and over again and which have well-defined results
Outcome: a result of an experiment
Sample Space: the list of all the possible outcomes of an experiment. Each individual outcome is a sample point.
Ways to Represent a Sample Space:

1. List the possible outcomes
2. Create a tree diagram
3. Create a Venn diagram

Event: any combination of outcomes
Equally likely: each outcome of an experiment occurs with equal probability

Practice Exercises 4.6.1

A. Write the sample space for each experiment.

1. A toss of a coin and a die.
2. A coin tossed three times.
3. A toss of two coins once.
4. A vowel of the English alphabet picked at random from a box.
5. A roll of a die and tossing a coin.

B. Do as directed in each of the following.

1. Let a coin and a die be tossed. Give the elements of the following events.
   - 1.1 A = {head or tail and an odd number}
   - 1.2 B = {an outcome with a number less than 4}
   - 1.3 C = {tails and an even number}
   - 1.4 D = {heads and a number less than 5}
   - 1.5 E = {an outcome with a number at most 4}
2. A pair of dice is rolled. Write the elements of each event.
   - 2.1 G = {the largest of one of the two numbers is 3}
   - 2.2 H = {the two numbers whose sum is at most 5}
   - 2.3 I = {the pair of numbers have an even sum}
   - 2.4 J = {the pair of numbers whose sum is 6 but none of the two is even}

Activity 4.6.1

A. Write the sample space for each experiment.

1. A toss of a die and a coin.
2. A coin tossed two times.
3. A toss of three coins once.
4. A day of the week picked at random from a box.

B. Do as directed in each of the following.

1. Let a die and a coin be tossed. Give the elements of the following events.
   - 1.1 A = {an even number and a head or tail }
   - 1.2 B = {an outcome with a number greater than 4}
   - 1.3 C = {an odd number and tails }
   - 1.4 D = {a number less than 3 and heads }
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