

This problem set is to help you become comfortable applying the counting rules and probability rules from **Chapter 5**. Many probability problems will use more than one rule, so a good strategy for answering probability questions is to first write down all the information you know from the problem, identify for what quantity you wish to solve, then identify any formulas that correspond to these pieces of information.

1. Your instructor has four favorite hiking locations in Clemson: Todd Creek Falls (T), Waldrop Falls (W), Meadow Falls (M), and the Issaqueena Lake trail in the Experimental Forest (I). One weekend, she decides to spend both Saturday and Sunday hiking. Assuming she will only visit one hiking location in a day and won't hike the same trail twice, answer the following questions.
  - (a) Construct a sample space of possible different ways Ms. V could hike over the two-day weekend.
  - (b) Your instructor is indecisive, so she decides to write the name of each hiking location on slips of paper, put them in a bowl, and randomly choose two locations. What is the probability that one of the hiking location she visits over the weekend will be Todd Creek Falls?
  - (c) What is the probability that she chooses to hike the Issaqueena Lake trail on Saturday?
2. Your Pie and BGR are two popular restaurants in Downtown Clemson. If a Clemson student is randomly selected, suppose the probability that they have eaten at Your Pie is 0.71 and the probability that they have eaten at BGR is 0.68. Suppose that, because each restaurant serves different types of food, these events are independent. Find the probability that a randomly selected Clemson student has eaten at either restaurant.

3. Last semester, 11.5% of Ms. V's STAT 2300 students were Animal and Veterinary Science majors and 50% were sophomores. 63.6% of the Animal and Veterinary Science majors were sophomores.
- (a) If a student from Ms. V's STAT 2300 section was selected at random, what is the probability that they are a sophomore majoring in Animal and Veterinary Science?
- (b) Are being a sophomore and being an Animal and Veterinary Science major mutually exclusive? How do you know?
- (c) Are being a sophomore and being an Animal and Veterinary Science major independent? How do you know?
- (d) What is the probability that a randomly selected STAT 2300 student from Ms. V's section is a sophomore or an Animal and Veterinary Science major?

4. 4-H is a youth development program for young people ages 8–18 years old to learn leadership, service, and other life skills. An avid 4-H member has attended a lot of 4-H events and now has an impressive collection of thirty-four 4-H t-shirts. He is attending a four-day event this summer and wants to wear a different shirt each day.

(a) He is curious to know how many four-day outfit possibilities he could have from his t-shirt collection. How many ways could he wear four different t-shirts over the four days?

(b) How many ways are there to choose which four t-shirts he packs in his suitcase?

(c) Out of his collection, seven of the t-shirts are green. What is the probability that he packs four green t-shirts?

(d) Nine of the t-shirts in his collection came from local county-level events. What is the probability that he does **not** pack a shirt from a county-level event?

(e) What is the probability that he packs **at least** one shirt that is **not** from a county-level event?

5. Succulent Studios is a company that offers monthly succulent subscription boxes, in which two cute little plants are shipped to your front door for \$16.50 per month. Suppose there is a 15% chance that a monthly box contains a rare succulent, a 2.5% chance that it will have a third bonus succulent, and a 0.5% chance that it will contain both. The company announces that they will include a bonus succulent for the month of December. Knowing this information, what is the probability that the box also contains a rare succulent?
6. In the intro survey at the beginning of the semester, 19.6% of students suggested a country music artist for the class playlist, and 9.1% of students specifically suggested country music by Morgan Wallen. If a student indicated a country music artist, what is the probability that it was Morgan Wallen?