

### 3.3.1: Exercises

1. Imagine a survey of students, faculty, and administrators is conducted to gauge the importance of using social media to interact with peers and colleagues. The data is summarized in the two-way table below.

	Very important	Somewhat important	Not important	Total
Students	65	82	52	199
Faculty	15	31	36	82
Administrators	9	15	15	39
Total	89	128	103	320

- a. What is the probability that a subject is a student or an administrator? Use probability notation in your answer. Write your answer as a fraction and decimal rounded to three decimal places.
- b. What is the probability that a subject feels social media is very important or somewhat important? Use probability notation in your answer. Write your answer as a fraction and decimal rounded to three decimal places.
- c. What is the probability that a subject is an administrator or feels social media is somewhat important? Use probability notation in your answer. Write your answer as a fraction and decimal rounded to three decimal places.
- d. What is the probability that a subject is not an administrator? Use probability notation in your answer. Write your answer as a fraction and decimal rounded to three decimal places.
- e. What is the probability that a subject does not feel social media is very or somewhat important? Use probability notation in your answer. Write your answer as a fraction and decimal rounded to three decimal places.

2. In a national pet owners survey, 39% of US households own at least one dog and 34% of households own a cat. Assume that 60% of US households own a dog or a cat.
- What is the probability that a randomly selected household owns neither a cat nor a dog?
  - What is the probability that a randomly selected US household owns both a cat and a dog?
3. Your friend Ainsley asks you to play a game. They win if the roll of two fair 4-sided dice results in different values. You win if you roll matching dice. You will play three rounds with Ainsley.
- Compute the probability that you win all three rounds.
  - Compute the probability that you lose at least one round.

4. The forecast for an upcoming weekend shows a 40% chance of rain on Saturday and a 65% chance of rain on Sunday. Assume these events are independent. What is the probability that it will rain at least once on the weekend?
5. Rafael is planning a 3-day vacation. The forecast for Friday, Saturday, and Sunday shows a 25% chance of rain on Friday, a 25% chance of rain on Saturday, and a 60% chance of rain on Sunday. Assume these events are independent. What is the probability that it will rain at least once on the weekend?
6. The director of a team of software engineers is tasked with selecting three of the engineers to work on a special short-term project. There are three female and five male engineers. All eight of the engineers are equally qualified, so random selection is used to form the group. What is the probability that the director randomly selects three females to make up the team? (Note that each individual can only be selected *once*).