

Lesson #21 · Topic 2C · Practice

Name _____

1. Brett asked his classmates in his 1st hour whether they had siblings and whether they had a pet. He recorded the information in the two-way table shown, including his own information. Suppose a student from Brett's 1st hour is chosen at random.

Define events X : has a sibling and Y : has a pet.

	Has a pet	No pets	Total
Has a sibling	13	11	24
No siblings	2	1	3
Total	15	12	27

- a. Find $P(X)$ and explain what this means in words.
- b. Find $P(Y^C)$ and explain what this means in words.
- c. Find $P(X \text{ or } Y)$ and explain what this means in words.
- d. Are the events X and Y mutually exclusive? Explain.

2. Suppose that a person from the United States is randomly selected. Determine if each pair of events would be considered mutually exclusive. Explain.
- a. Having a bachelor's degree and not having a bachelor's degree
 - b. Having a bachelor's degree and having a doctorate degree
 - c. Having a bachelor's degree and having attended college
 - d. Having a 9 AM philosophy class and having a 9 AM statistics class

3. In a class of 24 students, 15 students had been to Mt. Rushmore, five students had been to Mt. Rushmore and Yellowstone National Park, and three students had been to neither. Suppose a student from the class is selected at random.
- Make a Venn diagram to represent this scenario.
 - Find $P(\text{Mt. Rushmore and Yellowstone National Park})$.
 - Find $P(\text{Yellowstone National Park})$.
 - Find $P(\text{Mt. Rushmore or Yellowstone National Park})$.
 - Find $P(\text{Yellowstone National Park and Mt. Rushmore}^C)$.
4. There are 18 desserts at a potluck. Seven of the desserts are gluten-free and four of the desserts are dairy-free. The probability of randomly selecting a dessert that is either gluten-free or dairy-free is 0.5. How many of the desserts are gluten-free AND dairy-free?

5. A group of 66 upper-level math teachers was surveyed. Each teacher was asked to give their number of years of teaching experience and whether their first period of the day was an AP math class or a non-AP math class. The results are shown in the table. Suppose a teacher from this group is selected at random. Use appropriate notation to express and find each probability.

	Non-AP math class	AP math class
0-2 years	13	3
3-5 years	10	5
6-9 years	3	5
10+ years	6	21

- a. What is the probability that the teacher has 6-9 years of experience and teaches an AP math class during their first period?
- b. What is the probability that the teacher teaches an AP math class during their first period?
- c. What is the probability that the teacher has 3 or more years of experience?
- d. What is the probability that the teacher has 0-2 years of experience or teaches a non-AP math class during their first period?
6. According to a recent report, 26% of U.S. households own a pickup truck and 8% of U.S. households own a motorcycle. Suppose that a U.S. household is selected at random. What is the probability that the selected household owns a pickup truck or a motorcycle?
- A) 0.170
- B) 0.319
- C) 0.340
- D) The probability cannot be determined from the information provided.

7. A survey was sent to a random sample of individuals to learn about their traveling preferences. Of the 140 individuals who responded, 45 individuals reported United as their favorite airline, and 102 individuals said they fly only with a carry-on, rather than checking a bag. Let A represent the event of an individual reporting United as their favorite airline and B represent the event of an individual flying with only a carry-on. Which of the following statements is true?

A) $P(A \text{ or } B) = P(A) + P(B)$

B) $P(A \text{ and } B) > P(A \text{ or } B)$

C) $P(A) > P(B^C)$

D) $P(A^C) = P(B)$