

Lesson #20 · Topic 2C · Practice

Name _____

1. A variety pack (box) of instant oatmeal contains 30 packets of five different flavors of oatmeal. The number of packets of each variety is given in the table.

Oatmeal flavor	Plain	Cinnamon	Brown sugar	Apple	Peach
Quantity	10	5	8	4	?

Suppose that you randomly select a packet from a full box.

- What is the probability that you select a plain oatmeal? Use proper notation.
- What is the probability that you don't select a plain oatmeal? Use proper notation.
- What is the probability that you select a peach flavored oatmeal? Use proper notation.
- What is the probability that you select either cinnamon or brown sugar flavored oatmeal? Use proper notation.

2. Kelly rolls two fair six-sided dice and records the sum of the two numbers.

a. Complete the table below showing the sample space of all possible sums she could get when rolling two dice.

	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						

b. What is the probability of getting a sum of 7?

c. What is the probability of getting a sum of 9 or higher?

d. What is the probability of getting a sum that is even?

e. Define two events that have the same probability.

f. Are all outcomes in the sample space equally likely? Explain.

g. Are all sums of the two dice equally likely? Explain.

3. Each of the paper clips in a box is either pink, blue, orange, or green. There is at least one of each color in every box. Suppose that a paper clip is chosen at random. Order the following probabilities from least to greatest.

A. $P(\text{orange})$

B. $P(\text{orange} \cup \text{blue})$

C. $P(\text{orange} \cap \text{blue})$

4. At many universities, students rate their professors at the end of the semester on a 1-5 scale, where 1=awful and 5=awesome. A probability model for the ratings of one professor is given.

Rating	1	2	3	4	5
Probability	0.02	0.09	0.13	0.35	0.41

Suppose a student who has rated this professor's class is randomly chosen.

- What is the probability that the student rated the professor 3 or higher?
- What is the probability that the student did not give the professor a rating of 5?
- Identify two events that would be considered complements in this context. Show mathematically that they are complements.

5. Chloe was given the following problem in her Statistics class:

"A pencil case has seven pencils and three pens in it. Suppose you pick two writing utensils together at random. What is the probability that both are pencils?"

Chloe drew a 10x10 grid to represent the sample space of all combinations of writing utensils that could be chosen. She then counted 49 outcomes that included selecting two pencils. She concluded that the probability of picking two pencils is $\frac{49}{100}$.

Explain why Chloe is incorrect.

6. A standard 52-card deck has four suits (diamonds, hearts, clubs, and spades), each containing 13 cards. Of the 13 cards in each suit, three of them are considered “face cards” (the jack, queen, and king). Suppose you draw a card, look at it, return the card to the pile, re-shuffle the deck, and then draw another card.
- What is the probability that you draw two hearts?
 - What is the probability that you draw two face cards?
 - What is the probability that you draw two queens?
 - What is the probability that you draw two cards of the same suit?
7. You roll two fair, six-sided dice, one of which is red and the other of which is green. What is the probability that the number on the red die is strictly less than the number on the green die?
- $\frac{1}{4}$
 - $\frac{5}{12}$
 - $\frac{1}{2}$
 - $\frac{7}{12}$

8. A bag of chocolates has 20 milk chocolate squares and 10 dark chocolate squares. You are given the option of blindly selecting one, two, three, or four chocolates from the bag. You win a prize if there are more dark chocolate squares than milk chocolate squares. To maximize the chance of winning, how many chocolates should you select?
- A) One
 - B) Two
 - C) Three
 - D) Four