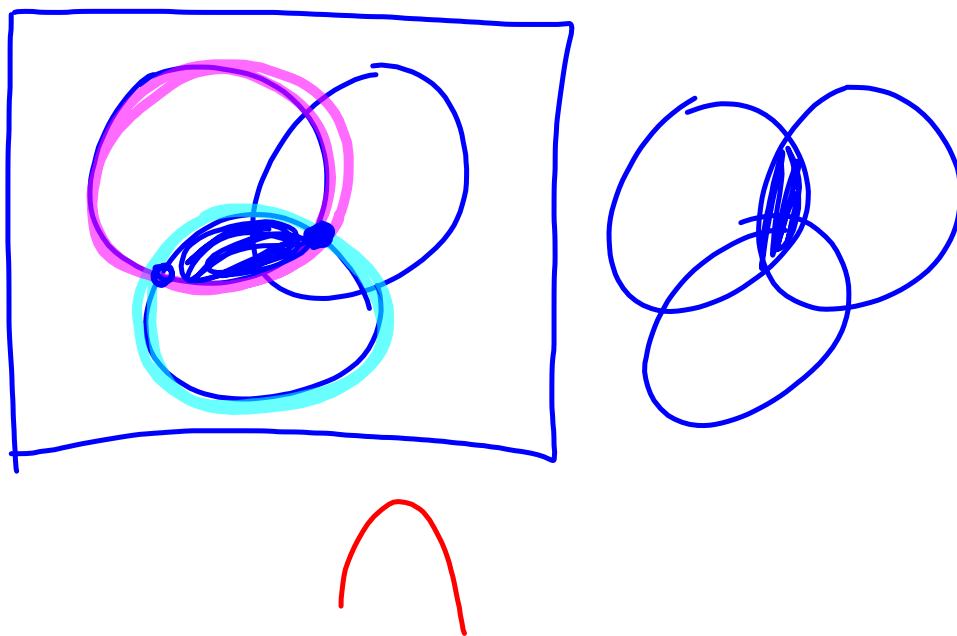
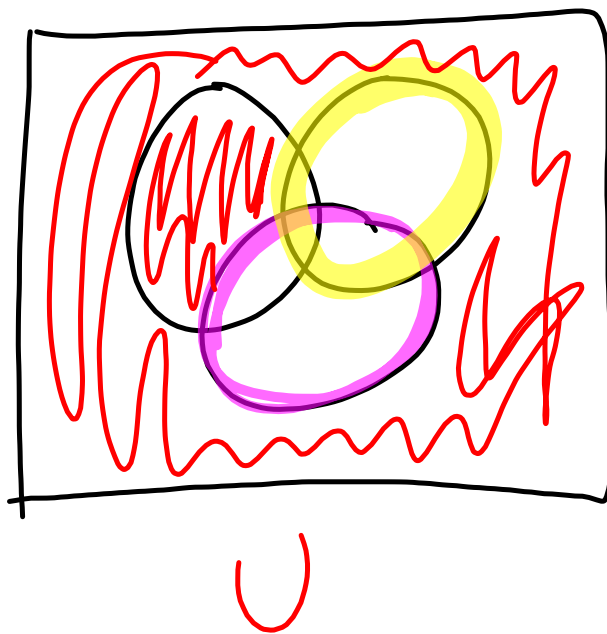
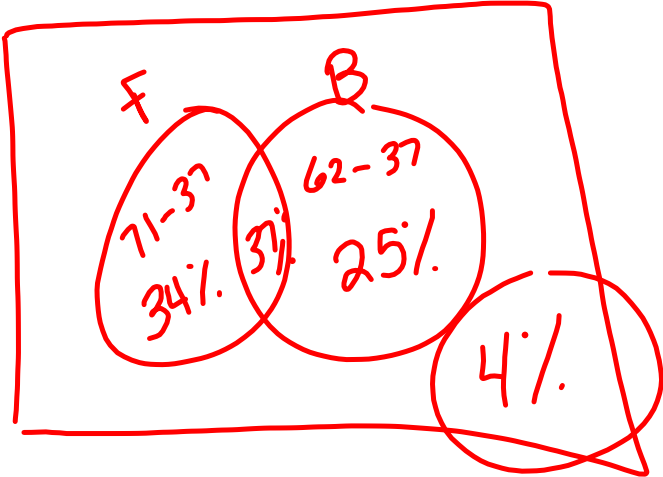


$$P(A/B) = \frac{P(A \cap B)}{P(B)}$$





3



Probability Study Guide

A. Marbles Scenario:

In a bowl of marbles, there are 10 red ones, 6 green ones, and 8 blue ones.

1. If a marble is chosen at random from the bowl, P(red one or a blue one)? $\frac{10}{24} + \frac{8}{24} = \frac{18}{24} = \frac{3}{4}$
2. If two marbles are chosen at random with replacement, P(red and a blue)? $\frac{10}{24} \cdot \frac{8}{24} = \frac{5}{36}$
3. If two marbles are chosen at random without replacement, P(they are both red)? $\frac{10}{24} \cdot \frac{9}{23} = \frac{15}{92}$

B. Soda Scenario:

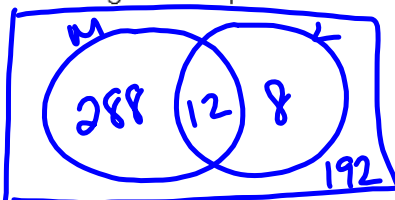
You have a cooler full of drinks. There are 12 regular cokes, 6 diet cokes, and 6 coke zeros. Find each of the following probabilities.

- $\frac{1}{4}$ 1. Find the probability of picking a diet coke.
- $\frac{5}{92}$ 2. Find the probability of picking a diet coke and then, another diet coke if the first one is not replaced.
- $\frac{6}{23}$ 3. Find the probability of picking a coke zero, given a regular coke has already been chosen.

C. Athlete Scenario:

Of 500 athletes surveyed, 300 were male and 20 were left-handed. Only 8 of the left-handed athletes were female.

A. Create a Venn Diagram to represent this situation.



B. Create a Two Way Table.

	L	R
M	12	288
F	8	192

C. What is the probability that an athlete was male or was left-handed?

$$\frac{308}{500} = \frac{77}{125} \approx .616$$

D. What is the probability an athlete was left handed given they were a male?

$$\frac{12}{300} = \frac{1}{25} \approx .04$$

D. The probability of a randomly chosen boy playing basketball is 0.30. The chance that a boy plays both basketball and football is 0.05. The chance that a boy plays football is 0.25. What is the probability that a randomly chosen boy plays basketball or football?

$$.30 + .25 - .05 = .5$$

Geometry

Unit 7: Probability

Study Guide

E. Pizza Topping Scenario:

The table below shows data about 108 pizzas sold in a pizzeria. Each pizza was sold with one topping.

Pizza shape	Pizza topping			
	Pepperoni	Mushroom	Onion	Chicken
Round	20	10	15	15
Square	16	8	18	6

60
48

Find each of the following probabilities.

$\frac{4}{9}$

1. Find $P(\text{Square})$

$\frac{1}{6}$

2. Find $P(\text{Mushroom})$

$\frac{17}{27}$

3. Find $P(\text{Round} \cup \text{Mushroom})$

$\frac{1}{18}$

4. Find $P(\text{Square} \cap \text{Chicken})$

$\frac{31}{36}$

5. Find $P(\text{Round} \cap \text{Onion})$

$\frac{5}{9}$

6. Find $P(\text{Round} | \text{Pepperoni})$

$\frac{2}{7}$

7. Find $P(\text{Chicken} | \text{Square})$

YES

8. Are liking pepperoni and choosing a round pizza independent of each other?

F. School Activity Scenario:

The table below represents a table about upperclassmen's suggestions for a class activity.

$\frac{7}{20}$

1. Find $P(11\text{th})$

$\frac{14}{40}$

$\frac{17}{40}$

2. Find $P(\text{Dance})$

$\frac{17}{40}$

$\frac{29}{40}$

3. Find $P(10\text{th} \cup \text{Dance})$

$\frac{14}{40}$

$\frac{3}{40}$

4. Find $P(\text{Field Trip} \cap 11\text{th})$

$\frac{3}{40}$

$\frac{19}{20}$

5. Find $P(12\text{th} \cap \text{Talent Show})$

$\frac{34}{40}$

$\frac{2}{3}$

6. Find $P(10\text{th} | \text{Field Trip})$

$\frac{2}{7}$

7. Find $P(\text{Talent Show} | 10\text{th})$

$\frac{8}{12}$

$\frac{4}{14}$

	Talent Show	Field Trip	Dance
10 th	4	8	2
11 th	5	3	6
12 th	2	1	9

Geometry

Unit 7: Probability

Study Guide

G. Ice Cream Scenario:

In a survey of 450 people, 200 of whom are female, it was found that 225 prefer chocolate ice cream including 99 males. Use this information to complete the table below.

	Males	Females	Totals
Vanilla	151	74	225
Chocolate	99	126	225
Totals	250	200	450

If a person is selected at random, find the probability that:

- The person likes chocolate. $\frac{225}{450} = \frac{1}{2}$
- The person like vanilla, given they are male. $\frac{151}{250}$
- The person likes vanilla or is a female. $\frac{225}{450} + \frac{200}{450} - \frac{74}{450} = \frac{39}{50}$
- Are being a male and liking chocolate independent events? Use calculations.
 $P(M \cap C) = \frac{99}{450} = \frac{11}{50}$ No $P(M) \cdot P(C) = \frac{250}{450} \cdot \frac{225}{450}$

H. Assume that the following events are independent:

- The probability that a high school student eats breakfast is 0.8.
- The probability that a high school senior will eat breakfast & get over 6 hours of sleep is 0.2.

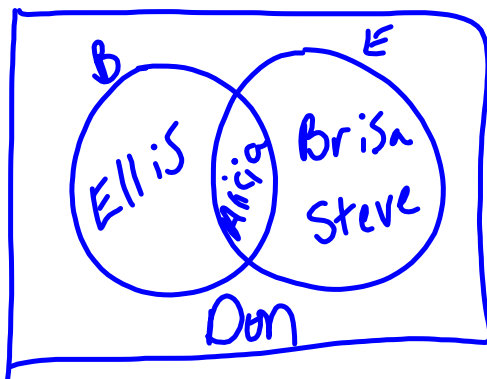
What is the probability that a high school senior will get over 6 hours of sleep, given that the person ate breakfast?

$.2 / .8 = .25$

I. Hector has entered the following names in the contact list of his new cell phone: Alicia, Brisa, Steve, Don, and Ellis. He chooses one of the names at random to call. Consider the following events:

- B: The name begins with a vowel 2
- E: The name ends with a vowel 3

Draw a Venn diagram to show the sample space and the events B and E. Then describe each of the following events by listing the outcomes.



- A. B $\frac{2}{5}$
- B. E $\frac{3}{5}$
- C. $B \cap E$ $\frac{1}{5}$
- D. $B \cup E$ $\frac{4}{5}$
- E. B' $\frac{3}{5}$
- F. $B' \cup E'$ $\frac{1}{5}$
- G. $B \cap E'$ $\frac{1}{5}$
- H. $B \cup E'$ $\frac{2}{5}$

Multiple Choice Practice

J. Which of the following are **mutually exclusive**?

- A. Choosing a King or a Diamond in a deck of cards
- B. Choosing a band student or math student in a classroom
- C. Rolling 2 dice and getting an even sum or a sum less than 7
- D. Choosing a Jack or a 5 in a deck of cards

Can't be a Jack and 5 at same time

K. Which of the following pair of events are **independent**?

- A. $P(A) = 0.08$; $P(B) = 0.4$; $P(A \cap B) = 0.12$
- B. $P(A) = 0.48$; $P(B) = 0.55$; $P(A \cap B) = 0.264$
- C. $P(A) = 0.16$; $P(B) = 0.24$; $P(A \cap B) = 0.32$

yes indep. $(.48)(.55) = .264$

L. A random survey was conducted about gender and hair color. This table records the data. What is the probability that a randomly selected person has blonde hair, given that the person selected is male?

Hair Color

	Brown	Blonde	Red
Male	548	876	82
Female	612	716	66

$\frac{876}{1506}$

- A. 0.51
- B. 0.55
- C. 0.58
- D. 0.63

M. Assume that the following events are independent:

- The probability that a high school senior will go to college is 0.72.
- The probability that a high school senior will go to college and live on campus is 0.46.

What is the probability that a high school senior will live on campus, given that the person will go to college?

- A. 0.26
- B. 0.33
- C. 0.57
- D. 0.64

$\frac{.46}{.72}$

N. A card is drawn from a deck of 52 cards. Find the probability that an ace or a heart is drawn.

- A. $\frac{7}{52}$
- B. $\frac{4}{13}$
- C. $\frac{3}{13}$
- D. $\frac{2}{13}$

$\frac{4}{52} + \frac{13}{52} - \frac{1}{52} = \frac{16}{52}$