

**Example 1:**

A bag contains 3 red balls and 4 green balls. You randomly draw one ball, replace it and randomly draw a second ball. What is the probability of the following events occurring?

Event A: The first ball is red.

Event B: The second ball is red.

$$\left(\frac{3}{7}\right)\left(\frac{3}{7}\right) = \left(\frac{9}{49}\right)$$

**Example 2:**

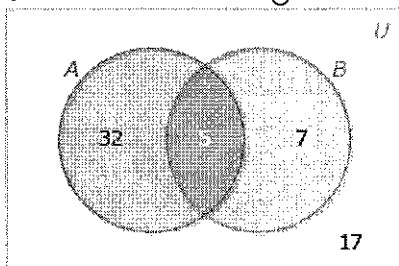
A pair of dice is being rolled. A possible event is rolling a sum of 5. What is the probability of the complement of this event?

- 1 4
- 2 3
- 3 2
- 4 1

$$1 - \frac{4}{36} = \frac{32}{36} = \left(\frac{8}{9}\right)$$

**Example 3:**

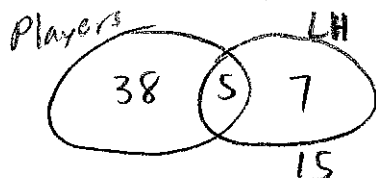
Use the Venn Diagram to find  $P(\overline{A \cap B})$ .



$$1 - \frac{5}{61} = \left(\frac{56}{61}\right)$$

**Example 4:**

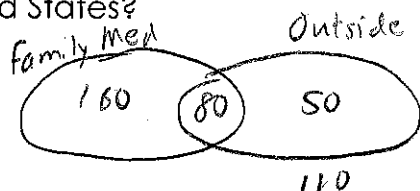
Of the 65 students going on the soccer trip, 43 are players and 12 are left-handed. Only 5 of the left-handed students are soccer players. What is the probability that one of the students on the trip is a soccer player or is left-handed?



$$P(S \cup L) = \frac{43}{65} + \frac{12}{65} - \frac{5}{65} = \left(\frac{10}{13}\right)$$

**Example 5:**

Of the 400 doctors who attended a conference, 240 practiced family medicine, and 130 were from countries outside the United States. One-third of the family medicine practitioners were not from the United States. What is the probability that a doctor practices family medicine or is from the United States?



$$\frac{240}{400} + \frac{110}{400} = \frac{350}{400} = \left(\frac{7}{8}\right)$$

**Example 6:**

The probability of a student playing badminton in PE class is 36%. The probability of a student playing football in PE is 38%. 48% of the students played at least one of the two sports during class. What is the probability, as a percent, of a student playing both sports during the period?

$$P(B \cup F) = P(B) + P(F) - P(B \cap F)$$

$$.48 = .36 + .38 - P(B \cap F)$$

$$P(B \cap F) = \left(0.26\right)$$

**Example 7:**

Bianca spins two spinners that have four equal sections numbered 1 through 4. If she spins a 4 on at least one spin, what is the probability that the sum of her two spins is an even number?



**Example 8:**

Mrs. Koehler surveyed 430 men and 200 women about their vehicles. Of those surveyed, 160 men and 85 women said they own a blue vehicle. If a person is chosen at random from those surveyed, what is the probability of choosing a woman or a person that does NOT own a blue vehicle? Hint: Draw a two way frequency table.

	Blue	Not Blue	Total
M	160	270	430
F	85	115	200
Total	245	385	630

$\frac{470}{630} = \frac{47}{63}$

**Example 9:**

A random survey was conducted to gather information about age and employment status. What is the probability that a randomly selected person surveyed is less than 18 years old, given that the person has a job?

Employment Status	Age (in Years)		Total
	Less than 18	18 or greater	
Has Job	20	587	607
Does Not Have Job	245	92	337
Total	265	679	944

$\frac{20}{607}$

**Example 10:**

Event A is choosing a heart card from a standard deck of cards.

Event B is choosing a face card from a standard deck of cards.

Find  $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$\frac{13}{52} + \frac{12}{52} - \frac{3}{52} = \frac{22}{52} = \frac{11}{26}$

**Example 11:**

For two events A and B, it is known that  $P(A) = 0.40$  and  $P(A \cap B) = 0.30$ .

Find  $P(B | A)$ .

$P(B|A) = \frac{P(A \cap B)}{P(A)} = \frac{0.30}{0.40} = \frac{3}{4}$

**Example 12:**

Let set A be the names of students who love the Georgia Bulldogs,

let set B be the names of students who love the Florida Gators,

and let set C be the names of students who love Clemson Tigers.

Find  $P(A \cup C)$ .

$\frac{9}{15} = \frac{3}{5}$

