1 Chapter Review

FREQUENTLY ASKED Questions

Study Aid
- See Lesson 1.4, Example 2.

Q: How can an understanding of sets help you conduct Internet searches?

A: Sets that are created by using the words "and", "or", or "not" can help you define your search. If you want the exact wording, use quotes around the word or phrase. To further reduce your hits, enter a "–" (minus sign) immediately before any words or phrases you want to avoid.

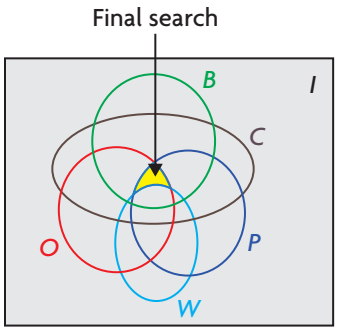
For example, suppose that you want a chocolate chip cookie recipe like your grandmother used to make. Searching *chocolate chip cookie recipe* nets 938 000 results. Using quotation marks, *"chocolate chip cookie recipe"* gets 172 000 results.

You remember that your grandmother's recipe contained oatmeal and pecans, so you search *"chocolate chip cookie recipe" and oatmeal and pecans*. You get 124 000 results.

You dislike walnuts, so now you search for *"chocolate chip cookie recipe" and oatmeal and pecans –walnuts*. You get 6270 results.

To further narrow your search, you look for the exact phrase *"brown sugar": "chocolate chip cookie recipe" and oatmeal and pecans –walnuts and "brown sugar"*. Now you have only 4660 recipes to check.

I = {all search results}
C = {"chocolate chip cookie recipe" }
O = {with oatmeal}
P = {with pecan}
W = {with walnut}
B = {"brown sugar"}



Study Aid
- See Lesson 1.4, Examples 1, 3, and 4.
- Try Chapter Review Questions 7 and 8.

Q: How can you solve a problem that involves three sets?

A: Draw a Venn diagram to represent the three sets. Enter the data you know. Any element in two or three sets is counted for each set. You may need to solve the problem using equations.

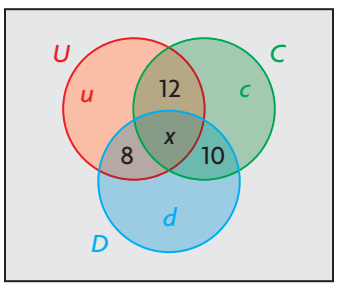
For example, suppose that 58 students are involved in one, two, or three school groups.
- 37 students play Ultimate.
- 30 dance.
- 35 play chess.
- 8 students dance and play Ultimate only.
- 10 students dance and play chess only.
- 12 students play Ultimate and chess.

How many students are in all three groups?

Using the Principle of Inclusion and Exclusion,

$$37 + 30 + 35 - (8 + x) - (10 + x) - (12 + x) + x = 58$$
$$7 = x$$

Therefore, 7 students are in all three groups.



PRACTISING

Lesson 1.1

1. a) Organize the following sets into a Venn diagram.
- U = {all letters in the alphabet}
- C = {capital letters}
- L = {lower-case letters}
- O = {consonants}
- V = {vowels}

b) List the complement of each set.
c) List any disjoint sets.
d) Are there any letters that fit in two categories?

2. The following five Aboriginal writers from across Canada toured Australia. They gave readings and lectures, and they participated in panels and workshops. Categorize these writers using a Venn diagram.
- Louise Halfe, poet
- Armand Ruffo, poet, fiction writer
- Lee Maracle, poet, novelist
- Richard Van Camp, poet, fiction writer
- Rita Mestokosho, poet

Lesson 1.2

3. A telephone company surveyed 96 people to learn about their telephone use.
- 84 people use a cellphone.
- 68 people use a land line.

How many people use both a cellphone and a land line?

4. There are 28 students on the school track and field team.
- 19 have black hair.
- 8 have blue eyes.
- 9 do not have black hair or blue eyes.

a) How many students have black hair and blue eyes? Explain.
b) How many students have black hair but not blue eyes?
c) How many students have blue eyes but not black hair?

Lesson 1.3

5. The teenagers at a summer camp are asked to choose an activity.
- 28 teenagers want to go canoeing.
- 45 want to go swimming.
- 20 want to do both.
- 11 do not want to do either.

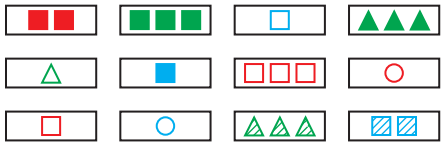
How many teenagers are at the camp?

6. Neil asked 40 people at a bookstore if they prefer romance novels or horror novels.
- 18 people do not like either type.
- 10 people like romance novels.
- 13 people like horror novels.

Determine how many people like both romance novels and horror novels.

Lesson 1.4

7. Grade 12 students at a high school were required to take at least one of physics, chemistry, or biology.
- 37 took physics.
- 62 took chemistry.
- 68 took biology.
- 27 took physics and chemistry.
- 15 took physics and biology.
- 33 took chemistry and biology.
- 12 students took all three sciences.

How many students were in Grade 12 that year?

8. Create six sets, with three cards in each set, from the following 12 cards. Each set of three cards must have
- the same number or three different numbers, and
- the same shape or three different shapes, and
- the same colour or three different colours.