

# 4.5

## Solving Percent Problems Using Decimals

### YOU WILL NEED

- a calculator

### GOAL

Use the decimal representation of a percent to solve a problem.

### LEARN ABOUT *the Math*

In Canada, more and more people are living in towns and cities. In January 2007, about 13.5% of Saskatchewan's population of 987 939 was Aboriginal. About 46.7% of the Aboriginal people were living in towns and cities.

**?** About how many Aboriginal people in Saskatchewan live in towns and cities?



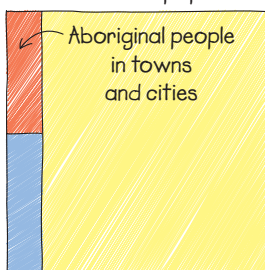
## Example 1

## Using simpler decimals to estimate

The question said “about”, so I decided to estimate.

### Angèle’s Solution

Saskatchewan’s population



13.5% is close to 10%

46.7% is close to 50%

$$\begin{aligned} 10\% \text{ of } 50\% &= 0.1 \times 0.5 \\ &= 0.05 \end{aligned}$$

987 939 is close to 1 000 000

$$0.05 \times 1\,000\,000 = 50\,000$$

About 50 000 Aboriginal people in Saskatchewan live in towns and cities.

I drew a diagram to help me figure out what to do.

I realized I had to calculate 46.7% of 13.5% of 987 939.

I estimated 13.5% as 10%.

Since I rounded 13.5% down, I rounded 46.7% up to 50% to estimate.

I needed 50% of 10%, so I multiplied equivalent decimals.

Then I multiplied by an estimate of the population. I used 1 million for that estimate.

### Reflecting

- A. Why could you not have just calculated 46.7% of 1 000 000 directly to solve the problem?
- B. Angèle rewrote the percents as decimals to solve the problem. How else could you have solved the problem?

## WORK WITH the Math

### Example 2 Solving a problem using decimal division

Online sales in Canada in 2006 were 139.8% of online sales in 2005. The value of the sales in 2006 was \$49.98 billion. What was the value of the sales in 2005?

#### Solution

$$139.8\% = 1.398$$

Write 139.8% as a decimal.

$$1.398 \times \text{2005 sales} = \text{2006 sales}$$

Write the equation relating the sales for 2005 and 2006.

$$1.398 \times \text{2005 sales} = \$49.98 \text{ billion}$$

Divide both sides by 1.398.

$$\begin{aligned} \text{2005 sales} &= \$49.98 \text{ billion} \div 1.398 \\ &= \$35.75 \text{ billion} \end{aligned}$$

Use a calculator to do the division.

Sales in 2005 were \$35.75 billion.

#### A Checking

- Write equations involving decimals you could use to solve each, then solve them.
  - 15.2% of 35 =
  - 124% of 18 =
  - 5.5% of  = 40
  - 160% of  = 30
- In November, the number of hits on the school blog rose to 112% of the number in October. There were 500 visitors to the blog in October. How many hits were there in November?

October: 500 hits on the school blog

November: 112% of the number of October hits

## B Practising

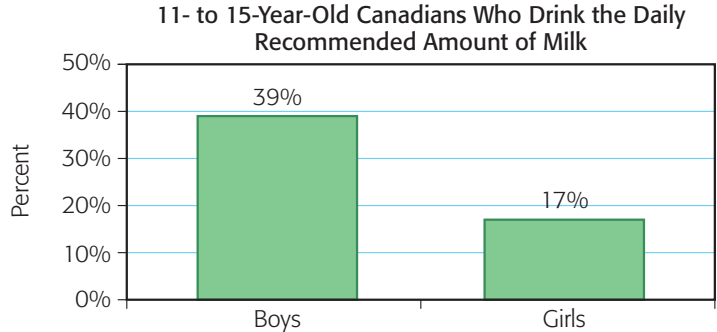
3. Solve each by using a decimal equivalent for the percent.
- a)  $1.4\%$  of  $500 = \square$       c)  $560 = 350\%$  of  $\square$   
b)  $0.45\%$  of  $250 = \square$       d)  $24 = 0.8\%$  of  $\square$
4. What percent question is Ellen solving when she performs each computation? For example, a question for the calculation  $40 \div 0.2$  could be, “40 is 20% of a number. What is the number?”
- a)  $0.45 \times 36$       c)  $0.004 \times 180$       e)  $36 \div 1.8$   
b)  $1.2 \times 45$       d)  $56 \div 0.07$       f)  $90 \div 0.005$
5. The cost of an item in Alberta is 105% of the listed price to include the GST. What is the cost of each of these items with tax included?



6. Jeff’s parents bought new flooring for his room. There was a sale so they only had to pay 80% of the regular cost. If they paid \$400, what was the regular price?
7. The chart below shows the most popular computer screen resolutions in Canada in 2007.  
In a school where 400 students had computers, about how many would be using a screen resolution of  $800 \times 600$ ?

Screen resolution	Percent of users
$1024 \times 768$	54.31%
$800 \times 600$	19.94%
$1280 \times 1024$	12.06%
$1280 \times 800$	3.93%
$1152 \times 864$	3.75%

8. Refer to the graph. In a school with 480 boys aged 11 to 15, how many boys drink the amount of milk they should?



9. It is predicted that Aboriginal people will make up 32.5% of Saskatchewan's population in 2045. They made up 13.3% of the population in 1995. Why is the population increase not  $32.5\% - 13.3\% = 19.2\%$  of the 2045 population?
10. The population of China is divided into 56 different ethnic groups. The population of the Han group is 90.56% of the Chinese population. Among the 55 other groups, the Dai people has the least population, which is 1.12% of the population of those 55 other groups. If the Chinese population is 1.6 billion, what is the Dai population?
11. Manuel is saving for a new mountain bike that costs 212% of the amount currently in his savings bank. The bike costs \$349. How much has he saved?
12. In a survey, 365 girls and 345 boys in Grade 8 were asked, "What is your favourite weekend activity?" 7.4% girls and 10.1% boys chose watching TV and videos. How many more boys than girls chose this activity?
13. Describe a percent question you would solve using each of these calculations:
- a)  $1.25 \times 400$       b)  $400 \div 1.25$       c)  $0.035 \times 400$