

6.7 exercise

A Express your answers to one decimal place when needed.

- 1 Find the distance travelled for each of the following.

	Speed	Time
(a)	15 km/h	2 h
(b)	25 km/h	3 h
(c)	2 m/s	15 s

- 2 Find the speed for each of the following.

	Distance travelled	Time taken
(a)	40 km	4 h
(b)	180 km	6 h
(c)	100 m	5 s

- 3 Find the time taken for each of the following.

	Distance travelled	Speed
(a)	200 km	50 km/h
(b)	60 km	20 km/h
(c)	100 m	2 m/s

B For each of the following problems, you need to decide whether the information you are asked to find is the *distance travelled*, the *time taken* or the *speed*.

- 4 A truck travelled 250 km in 5 h. At this speed, how long would it take to complete a trip of 650 km?
- 5 Mary Rose ran a distance of 3.5 km in 70 min. Calculate her average speed in kilometres per minute.

- 6 George's father drove the family car 150 km in 2.5 h. At this speed, how far would he travel in 10 h?

- 7 During the motoring trip Helen recorded the total distance as 325 km. The actual driving time was 4.2 h. Calculate her average speed in kilometres per hour.

- 8 Maggie's mother jogs at a speed of 2 m/s.

- (a) How far would she jog in 1 min?
(b) How long would it take her to jog 100 m?

- 9 Steven rides his bicycle at a speed of 15 km/h. How long would Steven take to ride 225 km at this speed?

- 10 The fastest swimming bird is the Gentoo penguin clocked at 14.5 m/s. How far will the bird swim in 1.5 min?

- 11 The first supersonic flight was at the speed of 0.3 km/s. How far would the jet travel in 2.5 h?

- 12 One of Air Canada's planes, the jumbo jet, has a cruising speed of about 1000 km/h.

- (a) How far would you expect the plane to fly in 3.5 h? 6.7 h? 8.25 h?
(b) How long would it take to fly 2000 km? 900 km? 1500 km? 2300 km?
(c) What assumption did you make in finding your answers in (a) and (b)?

C

- 13 (a) A lion travels at the speed of 25 m/s. How long would it take a lion to run 1 km?
(b) An elephant travels at the speed of 12 m/s. How long would it take to run 1 km?
(c) How much longer would it take an elephant to go 2.5 km than a lion?

6.6 exercise

A

- Express each rate in your own words.
 - Harry walks at a rate of 2 m/s.
 - Jean jogs at a rate of 4 m/s.
 - The truck travelled at 75 km/h.
 - The toothpaste cost \$1.92/100 mL.
- Calculate the cost of one item. (Remember: The cost of one item is often called the **unit cost** or **unit price**.) Express your answer to the nearest tenth of a cent.
 - 4 tins of apple juice, \$4.76.
 - A package of 10 garbage bags, \$1.89.
 - 2-roll package of paper towels, \$1.29
 - 24 tins of soft drinks, \$7.99
- Pierre babysits and charges \$1.50/h. How many hours did he babysit if he earned \$150.00 last summer?
- How much would 8 glasses cost if 5 glasses cost \$2.00?
 - How much would 100 kg of birdseed cost if 25 kg cost \$36.49?

B For each of the following problems:

▶ Solve the problem.

▶ List any assumptions you made to obtain the answer.

- Nathan types at a rate of 45 words per minute. How long would it take him to type 900 words?
- Steven scored 7 goals in 14 games. How many goals did he score per game?
 - How many goals would you expect him to score in 36 games?
- Nyghi walked 10 blocks in 25 min. How many blocks did she walk per minute?
 - How many blocks could she walk in 2 h?

- Susan scored 28 points in 4 games of basketball.
 - How many points did she score per game?
 - How many points would you expect her to score in 20 games?
- One week Jon worked 18 h washing cars and was paid \$58.50. What is his rate of pay per hour?
 - If Jon worked 65 h in July, how much was he paid?
- Use these ads to answer the following questions.

Store A

Store B

3 Badminton birds
for \$1.99

5 Badminton birds
for \$2.77

- Calculate the unit price at Store A.
 - Calculate the unit price at Store B.
 - Which store has the better rate?
- A solid milk-chocolate bunny costs \$5.78. It is made of 500 g of creamy chocolate. Calculate the cost per gram.
 - A common brand of chocolate bar has a mass of 35 g. The cost is 45¢. Calculate the cost per gram.
 - Compare the unit prices in (a) and (b). Give reasons why the prices would differ.

C

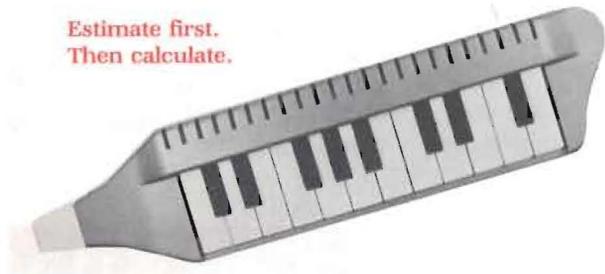
- Find ads in newspaper that give prices for the same items: fruit juices, chocolate, sugar, etc.
 - Collect the ads and calculate unit prices to compare the costs. Determine which store has the better buy.

B Percents can help you make comparisons.

- 5 Solve.
- (a) Of 45 people in the room, 27 were women. What percentage were women?
- (b) A macaroni and cheese dish had 250 g of macaroni and 45 g of cheese. What percentage of the dish was cheese?
- (c) Terry picked 8 baskets of tomatoes. His sister threw away 1 of the baskets due to bruising. What percentage were good?
- 6 What percent of the keys on the keyboard are

- (a) black? 55% (b) white?
- (c) Which percent is greater?

**Estimate first.
Then calculate.**



**Check whether your
answer is reasonable.**

- 7 Who saves the greater percent of her earnings? Estimate first, then calculate.
- ▶ Sara earns \$20 a week part-time and saves \$12.
 - ▶ Mirium earns \$23 a week part-time and saves \$14.
- 8 Who received the better mark?

(a) Student	Mark
Bruce	38 out of 50
Joelle	17 out of 20

(b) Glen	48 out of 60
Wendy	25 out of 30

- 9 The chart shows the results for the question asked in a survey,

"Do you enjoy winter sports more than summer sports?"

Day	Number of persons	Yes
Sat.	112	86
Sun.	89	64

On which day did the greater percentage say yes?

- 10 Vaughan earned \$32 last week and spent \$18. Ruth earned \$27 and spent \$21. Who spent the greater percentage?
- 11 In the voting for school president, the number of votes cast is shown. Everyone in the school voted.

Election Results	
Ruttan	125
Beavin	150
Truman	133

- (a) Calculate the percentage of votes each candidate received. (Round your answer to 1 decimal place.)
- (b) What do you notice about the total of the percentages? Why is this so?
- C**
- 12 The Garfields spend \$450 a month on housing.
- (a) If the income is \$2250 each month, what percentage of money is spent on housing?
- (b) What percentage is not spent on housing?
- (c) Find your answer in (b), using a different method.

problem-solving: strategy

To solve this problem you've really got to ask some important questions. (How can numbers and letters be related?)

The value of SUMMER HOLIDAYS is 182. What value would you expect for WINTER VACATION?

5 Calculate.

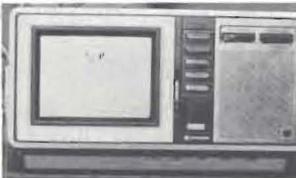
- (a) 15% of 27 lines (b) 27% of \$19
(c) 45% of 35 min (d) 37% of 87 laps
(e) 63% of 49 cm (f) 1.5% of 18 L
(g) 7.5% of \$1.75 (h) 46.5% of 525 g
(i) $8\frac{1}{2}\%$ of 120 L (j) $9\frac{1}{4}\%$ of \$620

6 Each article has a 15% discount. (The price is reduced by 15%.) Copy and complete the chart.

	Original Price	Discount	Selling Price
(a)	\$120	?	?
(b)	\$342	?	?
(c)	\$96	?	?

7 Find the selling price of each item. **15% off**

(a)  (b) \$386.88

\$18.99 

8 (a) Estimate which is more money.

- A 18% of \$300 B 28% of \$150

(b) Calculate A and B. How close were you?

9 Wendy has 240 computer programs. If 75% of them are games, how many games does she have?

10 Lori was at bat 120 times during the baseball season. If she hit the ball 15% of the time, how many times did she have a hit?

11 Neil has completed 60% of his practice time for the track meet. If he is expected to practise for 18 h, how long has he already practised?

12 In a computer program 255 characters can be stored in a string. If 20% of the string is filled, how many characters are there?

13 When water freezes, it increases in volume by about 12%. Calculate the volume of each amount of water after it freezes.

- (a) 100 L (b) 150 L (c) 300 L
(d) 12 L (e) 18 L (f) 250 L

Do you know why an iceberg floats? When water freezes it increases in volume. For this reason ice is less dense than water and floats.



14 The total length of the Trans-Canada Highway is 7870 km. About 6% of the highway is in Alberta. How many kilometres are in Alberta?

15 Of the persons surveyed, 70% chose the compact car. If 270 persons were surveyed, how many chose the compact car?

16 43% of the mass of the average person is muscle.

- (a) How much muscle does Ali have if he has a mass of 123 kg?
(b) How much of your body mass is muscle?

17 About 30% of the movies shown are Canadian. If 4820 movies were shown, how many were Canadian?

computer tip

Do you want to know the percent you received on a test? Use this program.

```
10 PRINT "PERCENT ON TEST"  
20 INPUT "TEST OUT OF"; T  
30 INPUT "MY MARK IS"; M  
40 LET P = 100 * M/T  
50 PRINT "MY PERCENT ON TEST IS"; P  
60 END
```

- 3 Find 100% of each number.
- (a) 1% of a number is 8.
100% of the number is \square .
 - (b) 1% of a number is 6.2.
100% of the number is \square .
 - (c) 1% of a number is 15.6.
100% of the number is \square .
- 4 Of the bolts, 1% are defective. There are 62 defective bolts. How many bolts in all are there?
- 5 Of the people surveyed, 1% did not reply. There were 42 persons who did not reply. How many persons in all were surveyed?
- 6 Find each number.
- (a) 1% of a number is 16.
 - (b) 10% of a number is 6.3
 - (c) 50% of a number is 140.
- 7 Find n in the following.
- (a) 10% of n is 3. (b) 40% of n is 10.
 - (c) 50% of n is 16. (d) 6% of n is 24.
- 8 Find the number if
- (a) 8% of the number is 32.
 - (b) 25% of the number is 5.
 - (c) 13% of the number is 65.
 - (d) 8% of the number is 64.
 - (e) 8% of the number is 12.
 - (f) 15% of the number is 18.

B For each of the following, express your answers to one decimal place or the nearest cent.

- 9 (a) Sarah needs 5 cards to complete her collection. If this is 10% of the total collection, how many cards are in the set?

- (b) About 15% of the tree seedlings planted grew. If 375 seedlings grew, how many were planted?
 - (c) Sasha hit 20% of the pitches thrown to her. If she had 8 hits, how many pitches were thrown?
- 10 The mass of a table tennis ball is 2.5 g. Its mass is 10% of the mass of a golf ball. Find the mass of a golf ball.
- 11 (a) Did you know that TIP means To Improve Performance? At the restaurant Betty left a 10% tip. If the amount of the tip was \$1.50, how much was the restaurant bill?
- (b) A customer left a 12% tip since the service was good. How much was the bill if the amount left as a tip was \$2.40?
- 12 Justin paid \$1.75 sales tax on the desk set he bought. If sales tax is at the rate of 8%, calculate the total amount of the bill.
- 13 At the Olympic Games, 85% of the stadium was full. There were 35 700 people.
- (a) What is the seating capacity of the stadium?
 - (b) What assumption did you make in finding your answer in (a)?
- 14 Of the garbage collected each day, 9.8% is metal. If 28.3 kg of metal were collected, how much garbage was there in all?
- C**
- 15 If 15% of 10% of a number is 9, find the number.

problem-solving: puzzler

Gregory grew 10% of his height and then grew 20% of his original height. If he grew 3.3 cm altogether, find his original height.