

CHAPTER

4

Percent

GETTING STARTED

Warm Up

- 4.1 Problem Solving: Use a Formula
- 4.2 Percent of a Number
- 4.3 Estimating With Percent: Mental Math
- 4.4 Discount and Sale Price
- 4.5 PST and GST
- 4.6 Commission
- 4.7 Problem Solving: Use Logic
- 4.8 Finding the Percent
- 4.9 100% of a Number
- 4.10 Simple Interest
- 4.11 Problem Solving With Percents
- 4.12 Problem Solving: Use a Table

Review

Chapter Check

Problem Solving: Using the Strategies

Answers CHAPTER 4 Percent





8. Write as a percent.

a) $\frac{3}{6} = \underline{\hspace{2cm}}\%$

b) $\frac{33}{50} = \underline{\hspace{2cm}}\%$

c) $\frac{75}{250} = \underline{\hspace{2cm}}\%$

Press $\boxed{C} \boxed{3} \boxed{\div} \boxed{6} \boxed{\%} \boxed{=}$

d) $\frac{12}{8} = \underline{\hspace{2cm}}$

e) $\frac{28}{80} = \underline{\hspace{2cm}}$

f) $\frac{20}{16} = \underline{\hspace{2cm}}$

Don't forget the percent sign (%).

Mental Math

Move the decimal to the right!

1. Calculate.

a) $16 \times 10 = \underline{\hspace{2cm}}$

b) $1.6 \times 100 = \underline{\hspace{2cm}}$

c) $126 \times 100 = \underline{\hspace{2cm}}$

d) $0.82 \times 10 = \underline{\hspace{2cm}}$

Move the decimal to the left!

2. Calculate.

a) $16 \div 10 = \underline{\hspace{2cm}}$

b) $1.6 \div 100 = \underline{\hspace{2cm}}$

c) $126 \div 100 = \underline{\hspace{2cm}}$

d) $0.82 \div 10 = \underline{\hspace{2cm}}$

3. Write as a decimal.

a) $\frac{6}{10} = \underline{\hspace{2cm}}$

b) $\frac{5}{100} = \underline{\hspace{2cm}}$

c) $\frac{1}{2} = \underline{\hspace{2cm}}$

d) $\frac{15}{100} = \underline{\hspace{2cm}}$

e) $\frac{1}{4} = \underline{\hspace{2cm}}$

f) $\frac{15}{10} = \underline{\hspace{2cm}}$

Reduce all answers!

4. Add.

a) $\frac{1}{2} + \frac{1}{2} = \underline{\hspace{2cm}}$

b) $\frac{1}{8} + \frac{3}{8} = \underline{\hspace{2cm}}$

c) $\frac{1}{4} + \frac{2}{4} = \underline{\hspace{2cm}}$

d) $\frac{1}{2} + \frac{1}{4} = \underline{\hspace{2cm}}$

e) $\frac{1}{5} + \frac{2}{10} = \underline{\hspace{2cm}}$

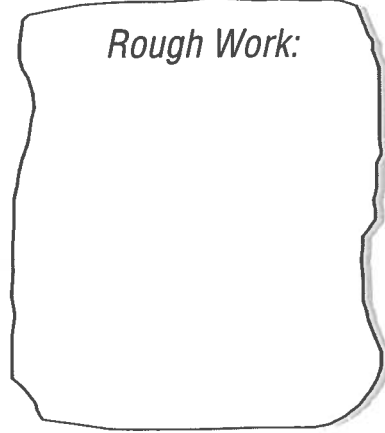
f) $\frac{1}{2} + \frac{1}{3} = \underline{\hspace{2cm}}$

$$\frac{1}{2} = \frac{1 \times 2}{2 \times 2} = \frac{\square}{4} + \frac{1}{4} = \underline{\hspace{2cm}}$$

$$= \frac{\square}{10} + \frac{2}{10} = \underline{\hspace{2cm}}$$



NO CALCULATOR



continues on next page →

5. Subtract.

Reduce all answers!

a) $\frac{7}{10} - \frac{2}{5}$

b) $\frac{3}{5} - \frac{1}{2}$

c) $\frac{30}{100} - \frac{3}{10}$

d) $\frac{3}{6} - \frac{1}{2}$

$\frac{2}{5} = \frac{2 \times 2}{5 \times 2}$



$= \frac{7}{10} - \frac{\square}{10}$

=

6. Multiply.

a) $4 \times \frac{1}{2}$

b) $6 \times \frac{1}{3}$

c) $10 \times \frac{1}{5}$

d) $12 \times \frac{1}{4}$

$= \frac{4}{1} \times \frac{1}{2}$

Reduce!

= _____

Reduce all answers!

7. Divide.

a) $1 \div \frac{1}{2}$

b) $6 \div \frac{1}{2}$

c) $\frac{1}{2} \div \frac{1}{2}$

d) $\frac{2}{3} \div \frac{1}{6}$

$= \frac{1}{1} \times \frac{2}{1}$

= _____

Skill Builder

1. Match each formula from the cloud with the correct shape.

- a) rectangle _____
- b) circle _____
- c) regular hexagon _____
- d) regular octagon _____
- e) square _____

Clue:

$P = 6s$

$P = 4s$

$P = 8s$

$P = (2 \times l) + (2 \times w)$

$C = \pi d$

2. Tick-Tack-Toe

Draw a line through the three answers that are the same.



50×60 = _____	30×30 = _____	600×80 = _____
$6000 \div 2$ = _____	$2700 \div 3$ = _____	700×60 = _____
10×300 = _____	$330 \div 3$ = _____	20×90 = _____

4.1 Problem Solving: Use a Formula



Problems and Applications

1. a) The tallest human on record was an American named Robert Wadlow. His feet were about 47 cm long.

Use the formula

$$S = 1.2 \times f - 22.6$$

to calculate his shoe size.



Formula → $S = 1.2 \times f - 22.6$

Substitute → $S = 1.2 \times \square - 22.6$

Calculate $S =$

Round your answer to the nearest whole number.



Sentence: _____

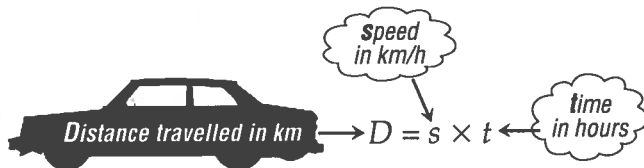
- b) Calculate your shoe size using one of the formulas below.

Females use: $S = 1.2 \times f - 20.6$ or Males use: $S = 1.2 \times f - 22.6$

Measure your foot in cm.

Sentence: _____

2. To calculate the distance a car travels, we use the following formula.



Calculate the distance for each car trip below.

- a) 3 h at 55 km/h

- b) 2.5 h at 80 km/h



$D = s \times t$ ← *Formula* →

$D = 55 \times \square$ ← *Substitute* →

$D =$ _____ ← *Calculate* →

Sentence: _____

Skill Builder

"of" means multiply!

1. Calculate.

a) $\frac{1}{2}$ of 16

b) $\frac{1}{3}$ of 9

c) $\frac{1}{5}$ of 10

d) $\frac{3}{10}$ of 20

$= \frac{1}{2} \times \frac{16}{1}$

Reduce all fractions.

e) $\begin{array}{r} 0.3 \\ \times 6 \\ \hline \end{array}$

f) $\begin{array}{r} 0.5 \\ \times 50 \\ \hline \end{array}$

g) $\begin{array}{r} 0.25 \\ \times 20 \\ \hline \end{array}$

h) $\begin{array}{r} 0.03 \\ \times 100 \\ \hline \end{array}$

2. Complete the table.

Fraction	Fraction out of 100	Decimal
a) $\frac{14}{100}$		
b) $\frac{3}{50}$	$\frac{3}{50} \begin{array}{l} \times 2 \\ \times 2 \end{array} = \frac{\square}{100}$	
c) $\frac{9}{10}$		
d) $\frac{1}{5}$		

Fraction	Fraction out of 100	Decimal
e) $\frac{4}{25}$		
f) $\frac{17}{10}$		
g) $\frac{1}{4}$		
h) $\frac{4}{5}$		

4.2 Percent of a Number

Practice

"of" means multiply!

1. Calculate.

a) 50% of 30

$= 0.5 \times 30$

$= \square$

b) 25% of 40

c) 15% of 60

d) 20% of 25

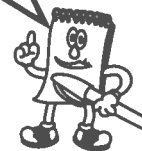
e) 30% of 50

f) 110% of 500

$= 1.1 \times \square$

$= \square$

Show your work.



2. Estimate, then calculate.



a) 12% of 25

Est. $0.1 \times 30 =$

$= 0.12 \times$ _____

$=$

b) 14% of 22

Est.

c) 8% of 140

Est.

d) 95% of 70

Est.

e) 14% of 85

Est.

f) 255% of 50

Est. $3 \times 50 =$ _____

3. Calculate.



a) 2.5% of 120

$= 0.025 \times$ _____

$=$

b) 87.5% of 400

c) 22.5% of 30

d) 6.75% of 120

e) 66.6% of 400

f) 38.9% of 600

4. Estimate, then calculate.

a) 13% of 190

Est. $0.1 \times 200 =$

$= 0.13 \times 190$

$=$

b) 48% of 95

Est.

c) 26% of 375

Est.

d) 62% of 210

Est.

5. Place $>$, $<$, or $=$ in each to make each statement true.



Work out each question!

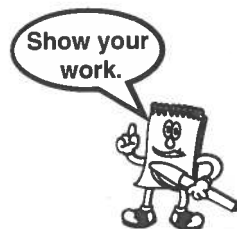
a) 6% of 120 60% of 12
 $= 0.06 \times 120$ $= 0.6 \times 12$
 $=$ $=$

b) 25% of 150 35% of 120

c) 64% of 3 16% of 12

Problems and Applications

6. The table shows where the money goes from the ticket sales for a live theatre show.



Artists	33%
Promotion	17%
Administration	15%
Production	23%
Theatre	12%



If a ticket costs \$40.00, how much of the \$40.00 goes to each category?

Artists

Promotion

Administration

33% of \$40

$= 0.33 \times$ _____

$=$

Production

Theatre

Sentence: _____

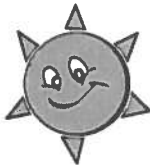
7. The area of Great Slave Lake is 28 600 km². The area of Lake Winnipeg is about 85% of the area of Great Slave Lake. What is the area of Lake Winnipeg?



_____ % of _____
 =
 =

Sentence: _____

Word



Change the word **WARM** to the word **COLD**.

- Rules: 1. Change only one letter at a time.
 2. Each time a letter is changed it must form a *real word*.

W A R M

W ___ R M ← Change A to O.

_____ ← Change M to .

_____ ← Change W to .

_____ ← Change R to .



Skill Builder

Calculate.



R: 35% of 640

$$= 0.35 \times 640$$

=

N: 40% of 120

E: 8% of 200

T: 75% of 28

P: 10% of 730

C: 30% of 60

A word is missing from the sentence below. To find the word, place the letter at the left of each question on the blank above the correct answer.

A is a fraction or

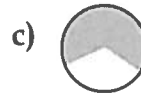
73 16 224 18 16 48 21

ratio in which the denominator is 100.

4.3 Estimating With Percent: Mental Math

Practice

1. Estimate the percent of each area that is shaded.



2. Estimate the percent of each number.

a) 49% of 82

b) 11% of 63

c) 9% of 212

d) 2% of \$308

Est.
 $\frac{1}{2}$ of 80 = _____

Est.

Est.

Est.

3. Estimate the percent for each of these marks.

a) 46 out of 52

b) 15 out of 19

c) 7 out of 16

or $\frac{46}{50}$

Est.
 $\frac{\square}{50} = \frac{\bigcirc}{10} = \text{---} \%$

Est.
 $\frac{\square}{20} = \frac{\bigcirc}{100} = \text{---} \%$

Est.

Problems and Applications

4. Estimate the 15% tip for each of these restaurant bills.

a) \$39.50

\$39.50 is about \$40

Note: 5% is $\frac{1}{2}$ of 10%

10% of 40 = $0.1 \times \text{---}$
 = \square

So, $\frac{1}{2}$ of \square = \square

$\square + \square = \text{---}$

Sentence: The 15% tip is about \square .

b) \$16.35

c) \$9.69

Start: → \$16.35 is about \square



Sentence: _____ .

Sentence: _____ .

Skill Builder

1. Estimate.

a) 20% of \$5.25

Est. $0.2 \times 5 =$ _____

b) 5% of \$9.99

Est. _____

c) 30% of \$340

Est. _____

d) 10% of \$18.55



NO CALCULATOR

2. Multiply.

a) $28.3 \times 0.1 =$ _____

b) $175 \times 0.1 =$ _____

c) $0.1 \times 2055 =$ _____

d) $0.67 \times 0.1 =$ _____

e) $3.2 \times 0.1 =$ _____

f) $0.1 \times 110 =$ _____

4.4 Discount and Sale Price Problems and Applications

1. Estimate, then calculate each discount.

a) 20% off a shirt that costs \$39.95

Est. $\rightarrow 0.2 \times 40 =$ _____



Calculate:

$$\begin{aligned} & 20\% \times 39.95 \\ & = 0.2 \times 39.95 \\ & = \boxed{} \end{aligned}$$

Show your work.



Sentence: The discount is .

b) 40% off perfume that costs \$72.00

Est. \rightarrow _____

Calculate:



Sentence: _____.

c) 60% off designer jeans that cost \$69.95

Est. \rightarrow _____

Sentence: _____.



2. (i) Estimate the sale price.
 (ii) Then, calculate each sale price.
 a) a \$2.99 binder at 20% off

Est.

Discount:
 $3 \times 0.2 = \boxed{}$

Sale Price:
 $\begin{array}{r} 3.00 \\ - \\ \hline \end{array}$

Calculate:

Discount = $20\% \times \$2.99$
 = 0.2×2.99
 = $\boxed{}$

Sale Price = *regular price* - *discount*
 = $2.99 - \boxed{}$
 = $\boxed{}$

Sentence: *The sale price is* $\boxed{}$.

- b) a \$1269 computer at 15% off

Est.

Discount:

Sale Price:

Discount →

Sale Price →

- c) a \$449 TV at 20% off

Est.

3. Write a problem that involves finding a discount or sale price. Have a friend solve your problem.

Skill Builder

1. Using the following ad,

Save
30%

ALL IN-STOCK
IN-LINE SKATES
Reg. \$199.99/Pair



a) calculate the discount.

b) calculate the sale price.

2. Using a newspaper flyer, find an example of an ad of an item you would like to purchase. Calculate how much you would save with the discount that a particular store is offering.

4.5 PST and GST Problems and Applications

1. Complete the table. Estimate the GST and PST in your province.



Item	Price	Estimated GST	Estimated PST
a) Radio	\$110.00	$0.07 \times 100 =$ <input type="text"/>	
b) T-Shirt	\$18.75		
c) Jeans	\$58.95		
d) Car	\$31 000		

2. Calculate the total cost for each of the following. Include the GST and PST in your province.

a) a portable phone at \$99.95

Selling Price = _____

GST = $0.07 \times$ _____ = _____

PST = _____ \times _____ = _____



Total cost =



Sentence: _____

b) a computer at \$2049.00

Selling Price = _____

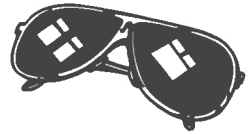
GST = 0.07 × _____ = _____

PST = _____ × _____ = _____

Add:

Total cost =

c) sunglasses at \$14.75



3. The *regular price* of a pair of boots is \$120.00. The *discount* is 10%. What is the *total cost*? (Include the GST and PST in your province.)

Skill Builder

Estimate.

1. 2% of \$850

Est.

2. \$28.45 + \$1.95

Est.

3. \$289.95 - \$102.34

Est.

4. 7% of \$39.95

Est.

4.6 Commission Problems and Applications

Show your work.



1. Omar sells real estate. He receives 1.5% commission on his sales. What is his **commission** on the following sales?

a) \$120 000.00

b) \$75 500.00



$$\begin{aligned} & 1.5\% \text{ of } 120\,000 \\ & = 0.015 \times \underline{\hspace{2cm}} \\ & = \boxed{\hspace{2cm}} \end{aligned}$$

His commission is _____.

2. Elizabeth sells new cars. She receives 2% commission for each car she sells. Find her **commission** for each of the following sales.

a) \$15 000.00

b) \$31 289.00



3. Marcia works in a clothing store. She earns \$7.50/h, plus 2% commission. One week she worked 20 hours and had sales of \$2060.00. Find her earnings for the week.

Facts: _____

Earnings for 20 h \rightarrow $\$7.50 \times 20$

$$= \underline{\hspace{2cm}}$$

Commission \rightarrow 2% of \$2060

$$= 0.02 \times \boxed{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

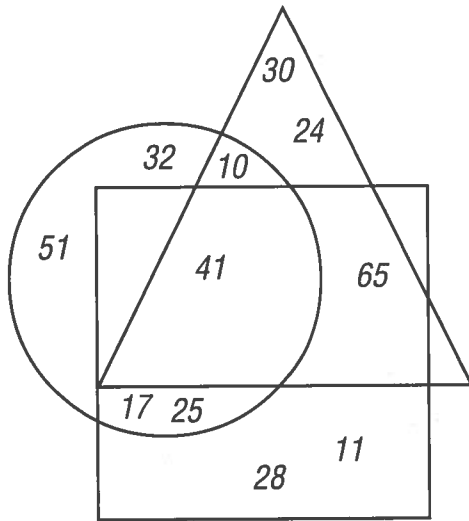
Total Earnings = _____ + _____ = _____

Sentence: _____

4. Allan works part-time in a clothing store. He is paid \$320.00 a month, plus 2% commission. For the month of June, he has sales of \$9329.00. How much does Allan earn for the month of June?

Skill Builder

1. Use this diagram.



a) What numbers are in the circle but not in the triangle?

b) What numbers are in both the square and the triangle?

2. Calculate.

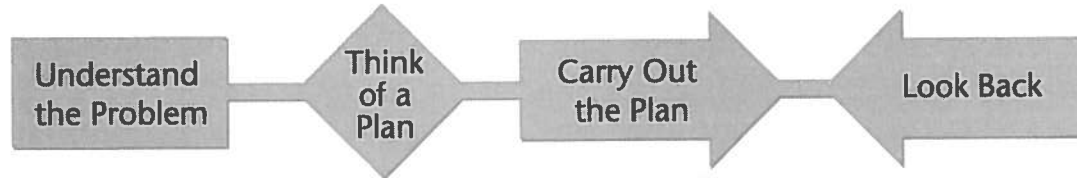
a) $4983 \div 100 =$ _____ b) $7650 \div 1 =$ _____ c) $592 \div 10 =$ _____

NO CALCULATOR

3. Calculate.

a) $529 \times 10 =$ _____ b) $9002 \times 100 =$ _____ c) $3.86 \times 10 =$ _____

4.7 Problem Solving: Use Logic



PROBLEM SOLVING

Problems and Applications

1. Robert, Peggy, and Jeff study painting, drama, and singing. The singer sang at Peggy's birthday party. Robert and the painter are brothers. **Who** is the singer?

	Robert	Peggy	Jeff
Painting			
Drama			
Singing			

Complete the chart.

Sentence: _____

2. Four students, Ana, Brenda, Carlos, and Devon, wrote a math quiz. It was marked out of 10. Their marks were 8, 7, 6, and 4. Devon's mark was half of Brenda's. Carlos got a higher mark than Ana. What mark did each student get?

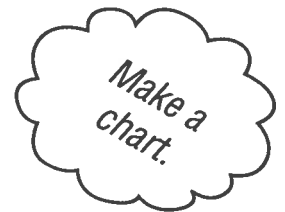
	Ana	Brenda		
8				
7				
6				
4				



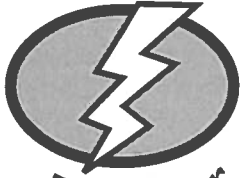
3. Mary, Harminder, and Allison each have one favourite subject. The subjects are math, history, and art. No one likes the subject that begins with the same letter as one's name. Mary is a cousin to the student who likes history. What is each person's favourite subject?

	Mary		
Math			

4. Francine, Donna, and Shelley finished first, second, and third in a race. Shelley was not third. Francine did not finish first, and Donna was not second. Shelley finished ahead of Donna. In what order did they finish the race?



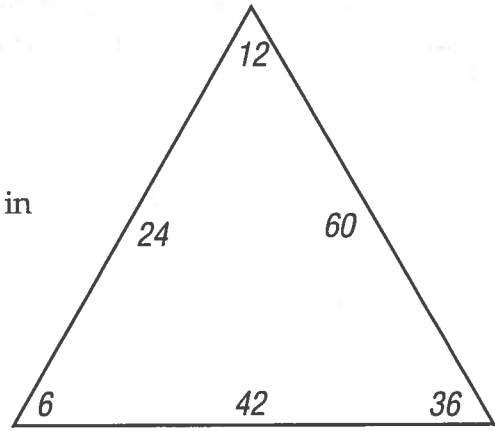
Pattern



Zapper

Look at the numbers in the triangle.

What do the numbers have in common?



Skill Builder

1. Write each fraction as a *decimal*.



a) $\frac{9}{10} = \underline{\hspace{2cm}}$ b) $\frac{1}{50} = \frac{\boxed{\hspace{1cm}}}{100}$ c) $\frac{2}{5} = \frac{\boxed{\hspace{1cm}}}{10}$ d) $\frac{2}{25} = \underline{\hspace{2cm}}$

= _____ = _____ = _____

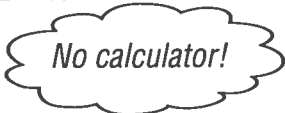
2. Write each fraction as a *decimal*. Round to the nearest thousandth (3 decimal places).



a) $\frac{1}{3} = \underline{\hspace{2cm}}$ b) $\frac{3}{8} = \underline{\hspace{2cm}}$ c) $\frac{5}{7} = \underline{\hspace{2cm}}$ d) $\frac{4}{9} = \underline{\hspace{2cm}}$

Press \boxed{C} 1 $\boxed{\div}$ 3 $\boxed{=}$

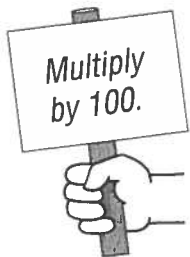
3. Subtract.



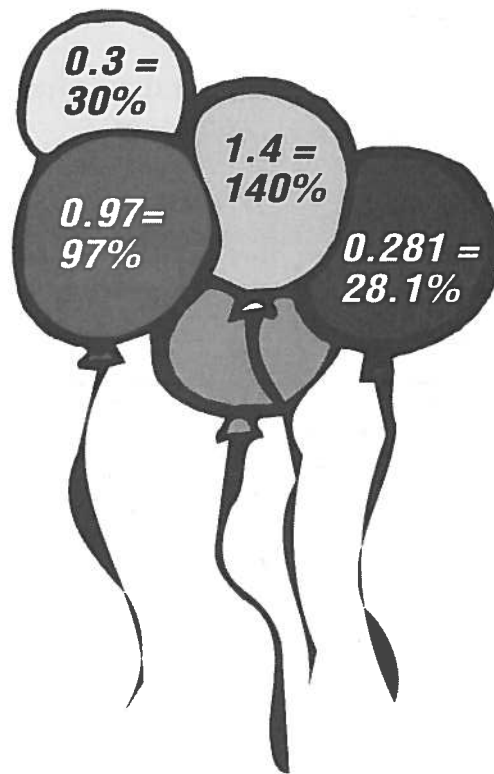
a) $\begin{array}{r} 528\ 423 \\ - 100 \\ \hline \\ \hline \end{array}$	b) $\begin{array}{r} 4517 \\ - 10 \\ \hline \\ \hline \end{array}$	c) $\begin{array}{r} 94\ 108 \\ - 1\ 000 \\ \hline \\ \hline \end{array}$	d) $\begin{array}{r} 306\ 022 \\ - 10\ 000 \\ \hline \\ \hline \end{array}$
e) $\begin{array}{r} 29\ 010 \\ - 100 \\ \hline \\ \hline \end{array}$	f) $\begin{array}{r} 1499 \\ - 1000 \\ \hline \\ \hline \end{array}$	g) $\begin{array}{r} 36\ 705 \\ - 10 \\ \hline \\ \hline \end{array}$	h) $\begin{array}{r} 6932 \\ - 1000 \\ \hline \\ \hline \end{array}$
i) $\begin{array}{r} 40\ 009 \\ - 100 \\ \hline \\ \hline \end{array}$	j) $\begin{array}{r} 505\ 213 \\ - 10\ 000 \\ \hline \\ \hline \end{array}$	k) $\begin{array}{r} 11\ 208 \\ - 10 \\ \hline \\ \hline \end{array}$	l) $\begin{array}{r} 7009 \\ - 10 \\ \hline \\ \hline \end{array}$

4.8 Finding the Percent Practice

1. Write each decimal as a percent.



Decimal	Percent (%)
a) 0.8	<input type="text"/> %
b) 0.67	<input type="text"/>
c) 1.67	<input type="text"/>
d) 0.02	<input type="text"/>
e) 2.4	<input type="text"/>
f) 0.515	<input type="text"/>
g) 0.302	<input type="text"/>
h) 0.999	<input type="text"/>
i) 0.007	<input type="text"/>



2. Write as a percent.

a) $\frac{4}{5} = \frac{4 \times 20}{5 \times 20}$

$$= \frac{\boxed{}}{100}$$

$$= \underline{\hspace{2cm}} \%$$

b) $\frac{3}{10}$

c) $\frac{8}{25}$

d) 11:20

e) 6:10

f) 3:4

Rewrite! $\frac{11}{20} = \frac{11 \times 5}{20 \times 5}$

$$= \frac{\boxed{}}{100}$$

$$= \underline{\hspace{2cm}} \%$$

3. Write as a percent.

a) $\frac{90}{72} = \underline{\hspace{2cm}} \%$

b) $\frac{24}{64} = \underline{\hspace{2cm}}$

c) $\frac{45}{150} = \underline{\hspace{2cm}}$

d) $\frac{11}{11} = \underline{\hspace{2cm}}$

Press 90 72

4. Write as a **percent**. Round to the nearest tenth (1 decimal place).

Example:

$$\begin{aligned} \text{a) } \frac{4}{9} &= 0.4444\dots \\ &= \mathbf{44.4\%} \end{aligned}$$

$$\begin{aligned} \text{b) } \frac{7}{9} &= 0.777\dots \\ &= \mathbf{77.8\%} \end{aligned}$$



a) $\frac{2}{3}$

b) $\frac{4}{7} = \underline{\hspace{2cm}}$
 $\hspace{2.5cm} = \underline{\hspace{2cm}}$

c) $\frac{5}{9} = \underline{\hspace{2cm}}$
 $\hspace{2.5cm} = \underline{\hspace{2cm}}$

d) $\frac{15}{11} = \underline{\hspace{2cm}}$
 $\hspace{2.5cm} = \underline{\hspace{2cm}}$

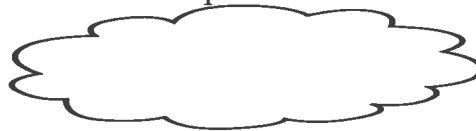
5. Calculate.

- a) 25 is what percent of 200? $\underline{\hspace{2cm}}$

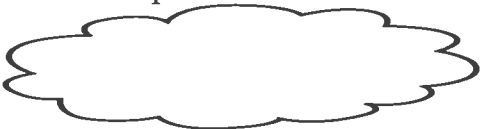


$$\frac{25}{200} = \underline{\hspace{2cm}}$$

- b) 12 is what percent of 24? $\underline{\hspace{2cm}}$



- c) 7 is what percent of 4? $\underline{\hspace{2cm}}$



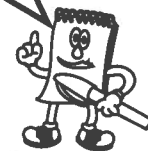
- d) What percent of 80 is 60? $\underline{\hspace{2cm}}$

$$\frac{60}{80} = \underline{\hspace{2cm}}$$

- e) What percent of 25 is 16? $\underline{\hspace{2cm}}$



Show your work.



Problems and Applications

6. In a math test, Lily answered 28 out of 35 questions correctly. What percent did she answer correctly?

7. A pair of sunglasses cost \$25.00. The price of the sunglasses decreased by \$5.00. By what percent did the price decrease?



Use each number tile only once to make the following sentences **true**. Use all the tiles.

2 **3** **5** **7** **8** **9**

$$\square + \square = \square$$

$$\square - \square = \square$$

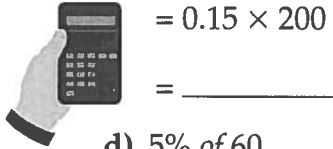
Skill Builder

1. Match each of the following with the correct answer from the cloud below.

a) 15% of 200
 $= 0.15 \times 200$

b) 1% of 400

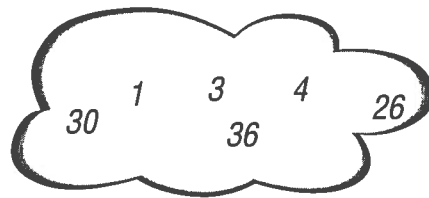
c) 12% of 300



d) 5% of 60

e) 100% of 26

f) 4% of 25



2. Write as a mixed number.

Example:

$$\frac{18}{7} = 2 \frac{4}{7}$$

a) $\frac{6}{5}$

b) $\frac{7}{3}$

c) $\frac{11}{9}$

d) $\frac{7}{4}$

3. Write as an improper fraction.

Example:

$$3 \frac{1}{4} = \frac{13}{4}$$

a) $1 \frac{2}{3}$

b) $1 \frac{7}{9}$

c) $3 \frac{4}{5}$

d) $2 \frac{1}{8}$

4.9 100% of a Number

Practice

1. Find the missing number, x .

$$\begin{aligned} \text{a) } \frac{40}{100} &= \frac{80}{x} \\ &= \frac{40 \times 2}{100 \times 2} \\ &= \frac{80}{\boxed{}} \end{aligned}$$

So, $x = \boxed{}$

$$\begin{aligned} \text{b) } \frac{10}{100} &= \frac{40}{x} \\ &= \frac{10 \times 4}{100 \times 4} \\ &= \frac{40}{\boxed{}} \end{aligned}$$

So, $x = \boxed{}$

$$\text{c) } \frac{9}{100} = \frac{54}{x}$$

$$\text{d) } \frac{5}{100} = \frac{25}{x}$$

$$\text{e) } \frac{9}{100} = \frac{45}{x}$$

$$\text{f) } \frac{30}{100} = \frac{90}{x}$$

2. If 10% of a number is 70, find the number.

$$\begin{aligned} \overset{\text{10\%}}{\rightarrow} \frac{10}{100} &= \frac{70}{x} \leftarrow \begin{array}{l} \text{part} \\ \text{total/whole} \end{array} \\ &= \frac{10 \times 7}{100 \times } \\ &= \end{aligned}$$

The number is $\boxed{}$.

3. If 9% of a number is 54, find the number.

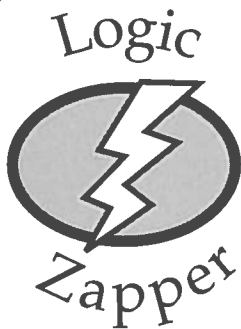
$$9\% = \frac{9}{100}$$



4. If 5% of a number is 20, find the number.

Problems and Applications

5. 10% of the price of a camera is \$30. What is the price of the camera?



The following statement is **false**. Make this sentence **true** by changing one or more words.

The sum of two odd numbers is an odd number.

Skill Builder

Calculate.

1. $4\% \times 20 \times 3$
 $= 0.04 \times 20 \times 3$
 $=$ _____

Change the %
to a decimal.

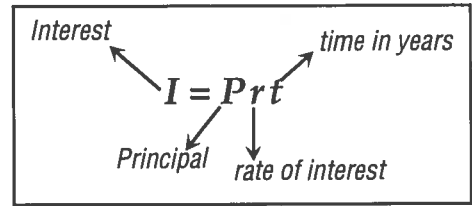
2. $3\% \times 400 \times 2$

3. $800 \times 6\% \times 1$

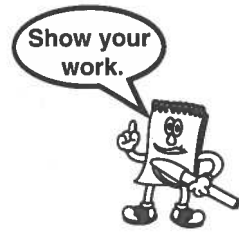
4. $1000 \times 2\% \times 5$

4.10 Simple Interest Problems and Applications

1. For each deposit,
 (i) calculate the *interest* and (ii) calculate the *amount*.



Principal	Interest Rate	Time (years)
a) \$800	6%	1
b) \$1000	7%	2
c) \$2000	3%	4



a) $P = 800, r = 0.06, t = 1$

b)

$I = Prt$

← Formula →



$= 800 \times 0.06 \times 1$

← Substitute →

$= \square$

← Calculate →

Amount $= P + I$

$= 800 + \square$

$= \underline{\hspace{2cm}}$

The interest is \square and the total amount is \square .

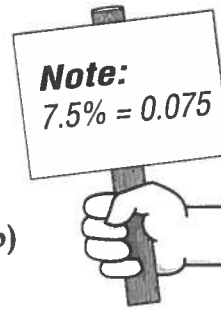
c)



2. For each loan,

(i) calculate the **interest** and (ii) the total **amount** to be paid back.

Principal	Interest Rate	Time (years)
a) \$750	9%	4
b) \$1000	7.5%	3
c) \$4500	9.2%	3



a) $P = \$750, r = 0.09, t = 4$

$I = Prt$

Formula

$= 750 \times \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}$

Substitute

$= \boxed{\hspace{2cm}}$

Calculate

Amount $= P + I$

$=$

$= \underline{\hspace{1cm}}$

The interest is $\boxed{\hspace{1cm}}$ and the total amount is $\boxed{\hspace{1cm}}$.

c)

3. Sofia has \$1000 in her bank account. The interest rate is 3% per year. What amount will she have after 3 years?



Skill Builder

1. Calculate.



$$\begin{aligned} &125\% \text{ of } 50 \\ &= 1.25 \times \underline{\hspace{2cm}} \\ &= \boxed{\hspace{2cm}} \end{aligned}$$

$$\begin{aligned} &24\% \text{ of } 104 \\ &= 0.24 \times 104 \\ &= \boxed{\hspace{2cm}} \end{aligned}$$

$$\begin{aligned} &45\% \text{ of } 90 \\ &= \end{aligned}$$

$$1.5\% \text{ of } 35$$



2. Find the *percent* for each of the following science test marks.

a) 15 out of 60

b) 30 out of 90

$$\frac{15}{60} = \underline{\hspace{2cm}} \%$$

Press \boxed{C} $15 \boxed{\div}$ $60 \boxed{\%}$ $\boxed{=}$

c) 21 out of 35

d) 64 out of 80



3. Find the number.

a) 20% of a number is 10.

$$\begin{aligned} \frac{20}{100} &= \frac{10}{x} \\ &= \frac{20 \div 2}{100 \div 2} \\ &= \frac{10}{\boxed{\hspace{2cm}}} \end{aligned}$$

The number is $\boxed{\hspace{2cm}}$.

b) 12% of a number is 6.

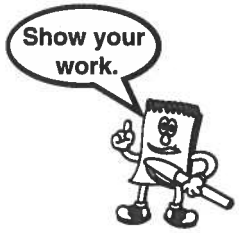
$$\begin{aligned} \frac{12}{100} &= \frac{6}{x} \\ &= \frac{12 \div 2}{100 \div 2} \\ &= \frac{6}{\boxed{\hspace{2cm}}} \end{aligned}$$

c) 20% of a number is 5.

d) 2% of a number is 12.

4.11 Problem Solving With Percents

Problems and Applications



1. a) The regular price of a jacket is \$150. During a sale, the price is reduced by 25%. What is the sale price?

Discount = $25\% \times 150$

Sale Price = Regular Price - Discount



=

=

=

=

Sentence: _____

- b) A week later, the price is reduced by 10% of the first sale price. What is the final sale price?

Discount = 10% of First Sale Price

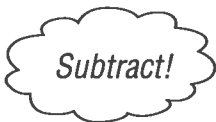
Final Sale Price =

=

=

Sentence: _____

- c) How much is the difference between the regular price and the final sale price?



Regular Price → _____

Final Sale Price → _____

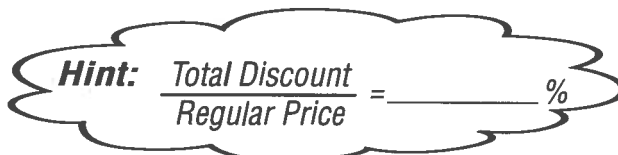
Difference = _____

Sentence: _____

- d) How much is the total discount (\$)?

Sentence: _____

- e) What percent of the regular price is the total discount?



Sentence: _____

2. Lloyd sells used cars. One month his sales totalled \$150 000. He earned 3% commission on the first \$50 000 and 6% commission on the next \$100 000 of sales.

- a) What commission did Lloyd earn on the first \$50 000?

$$3\% \text{ of } 50\,000$$

$$=$$



Sentence: _____

- b) What commission did Lloyd earn on the next \$100 000?

Sentence: _____

- c) What commission did Lloyd earn in total?

Sentence: _____

Skill Builder

1. Look for the patterns. Then, complete the tables.

a)

1	1
2	4
3	9
	16
5	
6	
7	

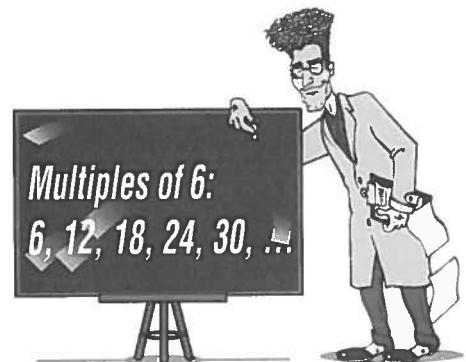


b)

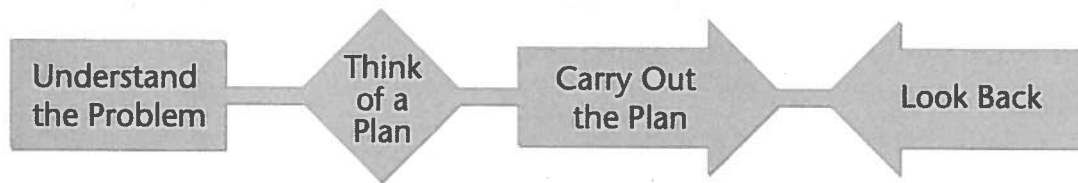
5	7
6	9
7	11
	13
	15
10	
11	

2. What are the next four multiples?

- a) 4, _____, _____, _____, _____.
- b) 7, _____, _____, _____, _____.
- c) 3, _____, _____, _____, _____.
- d) 10, _____, _____, _____, _____.
- e) 5, _____, _____, _____, _____.
- f) 8, _____, _____, _____, _____.



4.12 Problem Solving: Use a Table



Problems and Applications

1. The table shows the measurement, in metres, of the deepest spot(s) in each of the Great Lakes.



Lake	Greatest Depth (m)
Erie	64
Huron	229
Michigan	281
Ontario	244
Superior	405

- a) How much deeper is Lake Superior than Lake Huron?

Sentence: _____



- b) Lake Michigan is how many times deeper than Lake Erie?
(Round your answer to the nearest whole number.)

Sentence: _____

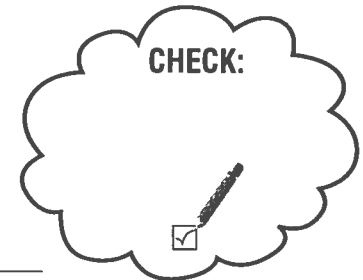


Divide!



- c) How many times deeper than Lake Ontario is Lake Superior?
(Round your answer to 2 decimal places.)

Sentence: _____



Divide!



- d) How many times deeper than Lake Erie is Lake Superior?
(Round your answer to the nearest whole number.)



Skill Builder

Calculate.



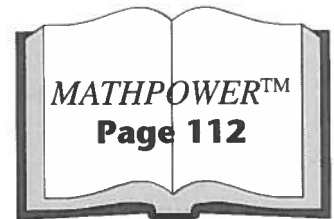
NO CALCULATOR

- | | | |
|----------------------------|---------------------------|----------------------------|
| 1. a) $8 \times 4 =$ _____ | b) $8 \times 40 =$ _____ | c) $8 \times 400 =$ _____ |
| d) $80 \times 4 =$ _____ | e) $80 \times 40 =$ _____ | f) $80 \times 400 =$ _____ |
| 2. a) $3 \times 5 =$ _____ | b) $3 \times 50 =$ _____ | c) $30 \times 50 =$ _____ |
| 3. a) $7 \times 2 =$ _____ | b) $70 \times 20 =$ _____ | c) $700 \times 20 =$ _____ |
| 4. a) $6 \times 6 =$ _____ | b) $6 \times 60 =$ _____ | c) $6 \times 6000 =$ _____ |
| 5. a) $4 \times 5 =$ _____ | b) $4 \times 500 =$ _____ | c) $40 \times 500 =$ _____ |

GETTING STARTED



Work together with your classmates, using your *MATHPOWER*TM student text, page 112.



Warm Up

1. Estimate, then calculate.

- | | | | | | | | |
|--|---|---|--|--|--|--|--|
| a) $\begin{array}{r} \$4.80 \\ 1.65 \\ \underline{2.19} \\ \hline \end{array}$ | Est. $\begin{array}{r} 5 \\ 2 \\ \underline{+ 2} \\ \hline \end{array}$ | b) $\begin{array}{r} \$64.20 \\ 9.40 \\ \underline{102.25} \\ \hline \end{array}$ | Est. $\begin{array}{r} \\ \\ \hline \end{array}$ | c) $\begin{array}{r} \$6.00 \\ 17.20 \\ \underline{1114.28} \\ \hline \end{array}$ | Est. $\begin{array}{r} \\ \\ \hline \end{array}$ | d) $\begin{array}{r} \$5.50 \\ 0.72 \\ \underline{359.60} \\ \hline \end{array}$ | Est. $\begin{array}{r} \\ \\ \hline \end{array}$ |
|--|---|---|--|--|--|--|--|

2. Estimate, then calculate.

- | | | | | | | | |
|--|--|--|--|---|--|--|--|
| a) $\begin{array}{r} \$64.77 \\ - 25.00 \\ \hline \end{array}$ | Est. $\begin{array}{r} 65 \\ - 25 \\ \hline \end{array}$ | b) $\begin{array}{r} \$46.25 \\ - 18.35 \\ \hline \end{array}$ | Est. $\begin{array}{r} \\ \\ \hline \end{array}$ | c) $\begin{array}{r} \$224.00 \\ - 69.95 \\ \hline \end{array}$ | Est. $\begin{array}{r} \\ \\ \hline \end{array}$ | d) $\begin{array}{r} \$75.89 \\ - 36.05 \\ \hline \end{array}$ | Est. $\begin{array}{r} \\ \\ \hline \end{array}$ |
|--|--|--|--|---|--|--|--|

3. Round to the nearest dollar.

Example:
 $\$389.71 \longrightarrow \390

- a) $\$6332.49 \longrightarrow$ _____ b) $\$719.61 \longrightarrow$ _____ c) $\$99.51 \longrightarrow$ _____

4. Write as a decimal.

Example:
two and seventy-two hundredths \longrightarrow 2.72

- a) twenty-nine thousandths \rightarrow _____
- b) one hundred sixteen and thirty-two hundredths \rightarrow _____
- c) one hundred nine and nine hundredths \rightarrow _____
- d) forty-one and forty-one hundredths \rightarrow _____

5. Estimate, then calculate.

a) $\begin{array}{r} 6.6 \\ \times 4 \\ \hline \end{array}$

Est.

$7 \times 4 =$

b) $\begin{array}{r} 60.4 \\ \times 12 \\ \hline \end{array}$

Est.

c) $\begin{array}{r} 7.5 \\ \times 3.5 \\ \hline \end{array}$

Est.

6. Calculate. Round each answer to the nearest hundredth.

a) $1 \div 3$

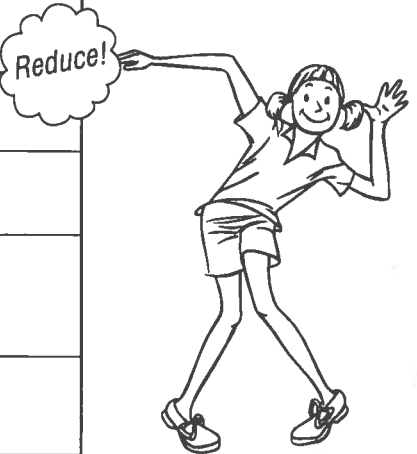
$3 \overline{) 1.000}$

b) $63.9 \div 7$

c) $8.2 \div 0.09$

7. Complete the table.

Written Words	Decimal	Fraction	Fraction in Lowest Terms
a) eight tenths	0.8	$\frac{8}{10}$	$\frac{8 \div 2}{10 \div 2} =$
b) four tenths			
c) twenty-five hundredths			
d) two hundred fifty thousandths			



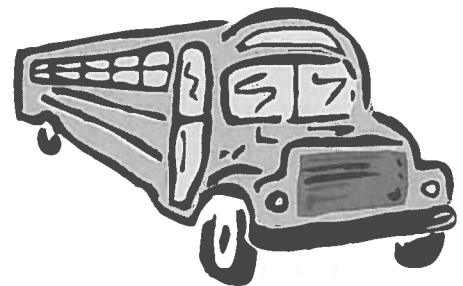
2. You have to deposit 30¢ into a coin counter at a pay phone. The counter will not accept pennies. Use the table below to decide how many different ways coins can be used to make exactly 30¢.

Number of Quarters	Number of Dimes	Number of Nickels	Total Value (¢)	Does total value = 30¢?
1	0	1	$(1 \times 25) + (0 \times 10) + (1 \times 5)$ $= 25 + 0 + 5$ $= 30$	Yes

Sentence: _____

3. The bus for the ski trip left the school at 08:00. The bus travelled at 50 km/h. Dino missed the bus and asked his father to catch up with it. Dino and his father left the school at 09:00. They travelled at 60 km/h. Complete the table to find when Dino and his father caught up to the bus.

Time	Distance (km) Travelled by bus	Distance (km) Travelled by car
08:00	0	0
09:00	50	0
10:00	$(2 \times 50) = 100$	60
11:00	$(3 \times 50) = \square$	$(2 \times 60) = \square$
12:00		



Sentence: _____

Review



1. Estimate.

a) 33% of \$190

$$\begin{array}{r} \text{Est.} \\ 200 \\ \times 0.3 \\ \hline \$ \end{array}$$

b) 78% of \$42

$$\begin{array}{r} \text{Est.} \\ \\ \\ \hline \end{array}$$

c) 105% of \$40

$$\begin{array}{r} \text{Est.} \\ \\ \\ \hline \end{array}$$

d) 0.5% of \$50

$$\begin{array}{r} \text{Est.} \\ \\ \\ \hline \end{array}$$

2. Estimate, then calculate.

a) 25% of \$39

$$= 0.25 \times 39$$

$$= \$ \boxed{}$$

$$\begin{array}{r} \text{Est.} \\ \\ \\ \hline \end{array}$$

b) 60% of \$145

$$\begin{array}{r} \text{Est.} \\ \\ \\ \hline \end{array}$$

c) 72% of \$4.50

$$\begin{array}{r} \text{Est.} \\ \\ \\ \hline \end{array}$$

d) 15% of \$2500

$$\begin{array}{r} \text{Est.} \\ \\ \\ \hline \end{array}$$

e) 205% of \$60

$$= 2.05 \times 60$$

$$= \$ \boxed{}$$

$$\begin{array}{r} \text{Est.} \\ \\ \\ \hline \end{array}$$

f) 120% of \$48

$$\begin{array}{r} \text{Est.} \\ \\ \\ \hline \end{array}$$

g) 107% of \$20

$$\begin{array}{r} \text{Est.} \\ \\ \\ \hline \end{array}$$

h) 0.6% of \$760

$$= 0.006 \times 760$$

$$= \$ \boxed{}$$

$$\begin{array}{r} \text{Est.} \\ \\ \\ \hline \end{array}$$

i) 1.5% of \$70

$$\begin{array}{r} \text{Est.} \\ \\ \\ \hline \end{array}$$

j) 7.5% of \$22.80

$$\begin{array}{r} \text{Est.} \\ \\ \\ \hline \end{array}$$

3. Estimate the 15% tip on the following restaurant bills.

a) \$15.75

\$15.75 is about \$16.

$$10\% \text{ of } 16 = 0.1 \times 16$$

$$= \boxed{}$$

Hint:

5% is $\frac{1}{2}$ of 10%

so, $\frac{1}{2} \times \boxed{} = \boxed{}$

$$\boxed{} + \boxed{} = \underline{}$$

b) \$73.10

The 15% tip is about _____.

The 15% tip is about _____.

c) \$59.88

\$59.88 is about \$60.

10% of 60 = _____ × _____

=

so, $\frac{1}{2} \times$ =

+ = _____

The 15% tip is about .

d) \$22.05

Hint:
5% is $\frac{1}{2}$ of 10%

4. Calculate. Round your answer to the nearest cent (2 decimal places).



a) 75% of \$80.50

= $0.75 \times \$80.50$

= \$

b) 25% of \$30.25

c) 60% of \$345

d) 5% of 68

e) 125% of 70

= $1.25 \times$ _____

= \$

f) 600% of \$22.50

g) 1.3% of \$25 000

= $0.013 \times$ _____

= \$

h) 2.2% of \$350

5. a) What percent is 35 of 56?

$\frac{35}{56} =$ _____



Press 35 ÷ 56 % =

b) What percent is 22 of 77?

Round to the nearest percent.

6. a) What percent of 50 is 2.5?

$\frac{2.5}{50} =$

b) What percent of 60 is 150?

7. a) If 12% of a number is 6, what is the number?

$$\begin{aligned}\frac{12}{100} &= \frac{6}{x} \\ &= \frac{12 \div 2}{100 \div } \\ &= \frac{6}{}\end{aligned}$$

The number is .

b) If 40% of a number is 80, what is the number?

8. Jim has 4 nickels and 6 dimes.

a) What percent of his coins are nickels?

Hint: $\frac{\text{\# of nickels}}{\text{total \# of coins}}$

Change the fraction to %.

b) What percent of his coins are dimes?

9. The elevation of Moose Jaw above sea level is 680% of the elevation of Kingston. The elevation of Kingston is 80 m. What is the elevation of Moose Jaw?

$$\begin{aligned}&680\% \text{ of } 80 \\ &= 6.8 \times \\ &= \end{aligned}$$

Sentence: _____

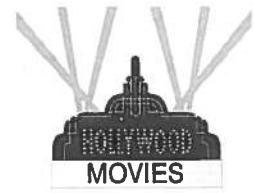
10. An average Canadian eats about 2.7 kg of breakfast cereal per year. An average American eats about 200% of this amount. How much cereal does the average American eat per year?

$$\begin{aligned}&200\% \text{ of } \\ &= \phantom{200\% \text{ of } } \end{aligned}$$



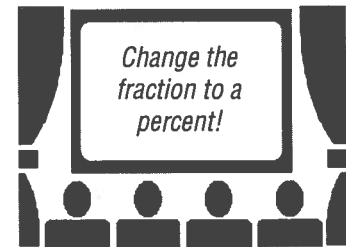
Sentence: _____

11. Last year, the price of a theatre ticket was \$8. This year it is \$10.
 a) What is the amount of the increase?



- b) What is the percent increase over last year's price?

$$\frac{\text{increase (\$)}}{\text{last year's price}}$$



- c) What percent of last year's price is this year's price?

$$\frac{\text{this year's price}}{\text{last year's price}}$$

12. Calculate the *discount* and *sale price*.



- a) \$22.50 book at 10% off

$$\text{Discount} = 10\% \times \$22.50$$

$$= \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

$$\text{Sale Price} = \text{Regular Price} - \text{Discount}$$

$$\text{SP} = \$22.50 - \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

The *discount* is and the *sale price* is .

- b) \$159.00 coat at 15% off



- c) \$79.99 coat at 25% off

13. For each item below, calculate the GST.

a) \$62.95 watch



GST = 7% of \$62.95

$$= \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$$

$$= \boxed{\hspace{4cm}}$$

b) \$95.00 pair of shoes

GST:

c) \$1299.00 stereo

d) \$450.00 bicycle

14. Calculate the **total cost**, including the GST and PST in your province.

a) a can of tennis balls for \$3.99

GST =

PST =



Total Cost: _____

b) a pair of socks for \$5.99

c) 2 CDs at \$17.99 each

d) a bicycle at \$299



15. A pair of pyjamas costs \$13.50. The pyjamas are on sale with a discount of 10%.
a) How much is the discount?

b) What is the sale price? (Include the GST and the PST in your province.)

-
16. Mario sold a \$156 000 house and received a commission of 2%.
How much commission did he earn?



-
17. John has \$200 in his savings account. The interest rate is 3% per year.
a) How much interest will he receive at the end of one year?

\$200 = Principal

$$I = Prt$$



-
- b) What amount of money will he have at the end of one year?

$$\text{Amount} = \text{Principal} + \text{Interest}$$

Chapter Check

1. Calculate the following percents.

a) 12 out of 25



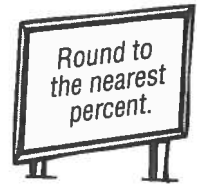
$$\frac{12}{25} = \text{_____} \%$$

Press \boxed{C} $\boxed{12}$ $\boxed{\div}$ $\boxed{25}$ $\boxed{\%}$ $\boxed{=}$

c) 2 out of 500

b) 4 out of 22

d) 0.5 out of 3.5

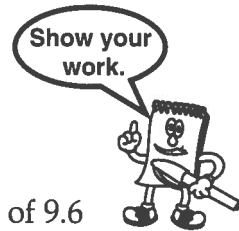


2. a) What percent of 20 is 35?



$$\frac{35}{20} = \text{_____} \%$$

b) What percent of 500 is 350?



3. Calculate.

a) 1% of 300

b) 46% of 60

c) 15% of 9.6

$$= 0.01 \times 300$$

$$= \boxed{}$$

d) 12.5% of 80

e) 2.5% of 300

f) 120% of 55

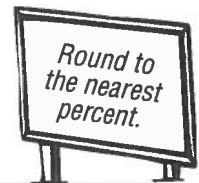
$$= 0.125 \times \text{_____}$$

$$= \boxed{}$$

4. There are 30 animals in a field. 24 are cows. What percent of the animals are cows?



5. The human body has 206 bones. 29 of the bones are in the skull. What percent of the bones are in the skull?



6. If 5% of a number is 10, what is the number?

$$\frac{5}{100} = \frac{10}{\boxed{}}$$

7. Estimate the 15% tip on a \$14.05 restaurant bill.



8. Tony has \$500.00 in his savings account. He will earn 3% interest per year.
a) How much interest will he earn after 1 year?

$$I = Prt$$

b) What amount of money will he have after 1 year?

9. Calculate the total price, including taxes, of a \$250 CD player.

10. Manya sold \$10 500.00 worth of computers in one week. She earned 4% commission on her sales. How much commission did she earn that week?



11. The regular price of a coat is \$199.00. It is sold at a discount of 25%.
a) Calculate the amount of the **discount**.

b) What is the **sale price**?

Problem Solving: Using the Strategies

Show all your work on looseleaf!

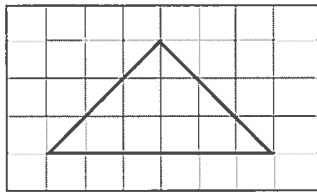


1. Complete the magic square. Each row, column and diagonal **must** add up to 18.



9	2	7
4		
5	10	

2. a) What is the area of this triangle?



- b) Sketch this triangle on grid paper. Cut it out and use it for a pattern.
 c) Sketch all the different figures that can be made by placing this triangle and 1 **identical** triangle together along one side.

"Identical"
— same size and shape

- d) Find the area of each figure that you made.

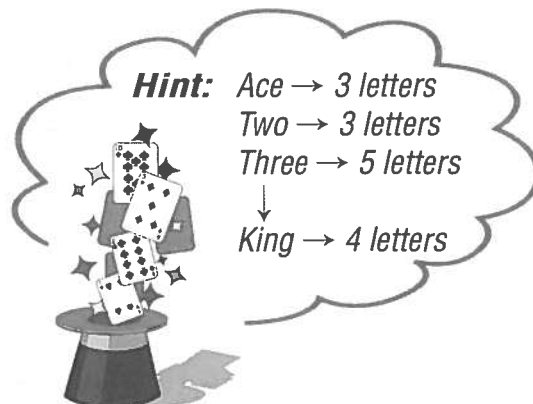
3. Use the following digits and decimal point.



- a) Write the largest number possible.
 b) Write the smallest number possible.
 c) Write the number that is closest to 10.

Do not use the decimal point at the beginning or the end of the number.

4. The pages of a book are numbered from 1 to 101. How many page numbers contain at least one 5?
 5. Add the numbers of letters in the names of the cards in a suit of playing cards.



What do you notice about the total?

