

CHAPTER

7

Measurement

GETTING STARTED

Warm Up

- 7.1 The Pythagorean Theorem
- 7.2 Using the Pythagorean Theorem
- 7.3 Perimeter
- 7.4 Perimeters of Polygons
- 7.5 Circumference of a Circle
- 7.6 Area of a Rectangle and Square
- 7.7 Area of a Parallelogram
- 7.8 Area of a Triangle
- 7.9 Area of a Circle
- 7.10 Areas of Composite Figures
- 7.11 Working With Perimeter and Area

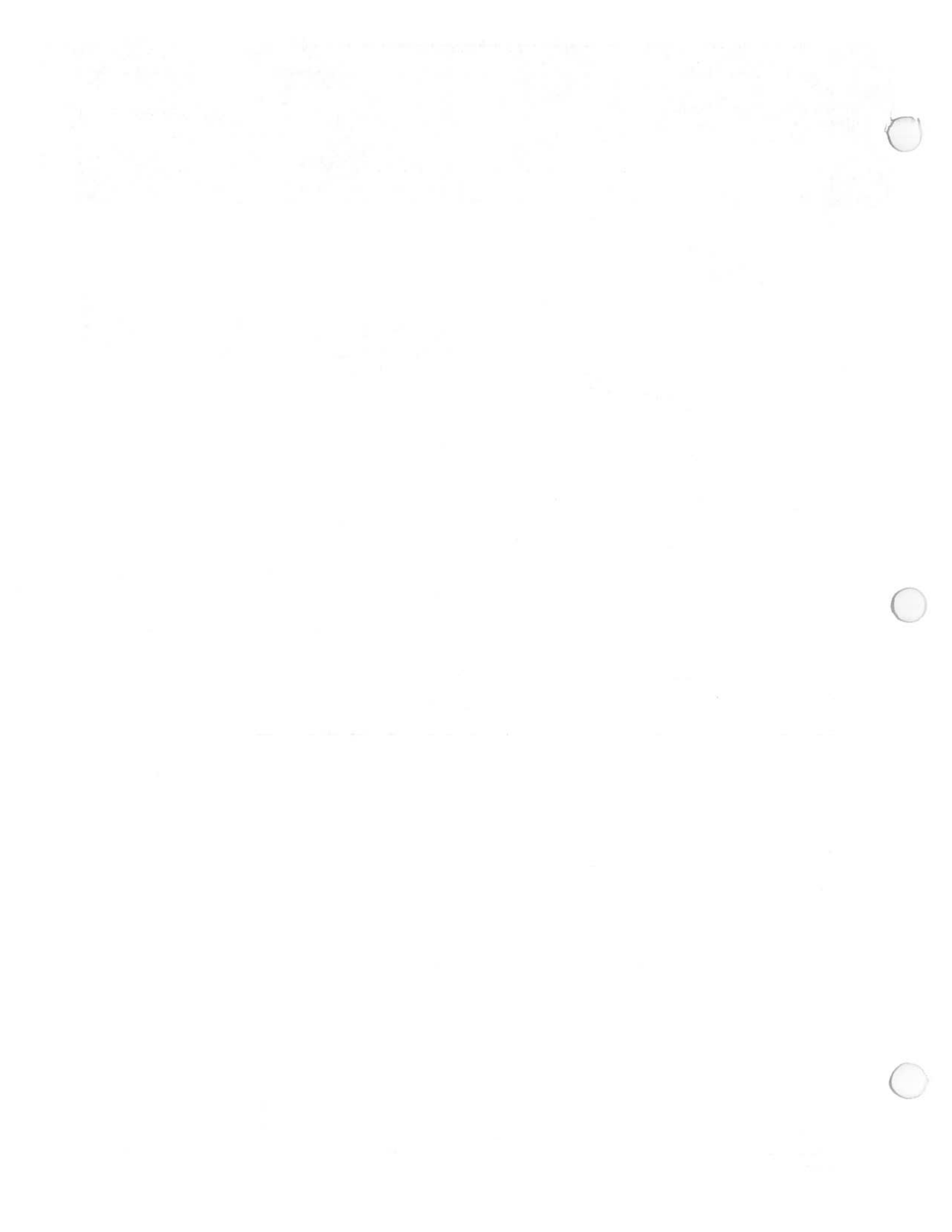
Review

Chapter Check

Problem Solving: Using the Strategies

Answers CHAPTER 7 Measurement





Skill Builder



NO CALCULATOR

Add the following.

1.
$$\begin{array}{r} 99 \\ + 99 \\ \hline \end{array}$$

2.
$$\begin{array}{r} 98 \\ + 103 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 99 \\ + 45 \\ \hline \end{array}$$

4.
$$\begin{array}{r} 25 \\ + 98 \\ \hline \end{array}$$

5.
$$\begin{array}{r} 97 \\ + 58 \\ \hline \end{array}$$

6.
$$\begin{array}{r} 97 \\ + 60 \\ \hline \end{array}$$

7.
$$\begin{array}{r} 64 \\ + 99 \\ \hline \end{array}$$

8.
$$\begin{array}{r} 98 \\ + 17 \\ \hline \end{array}$$

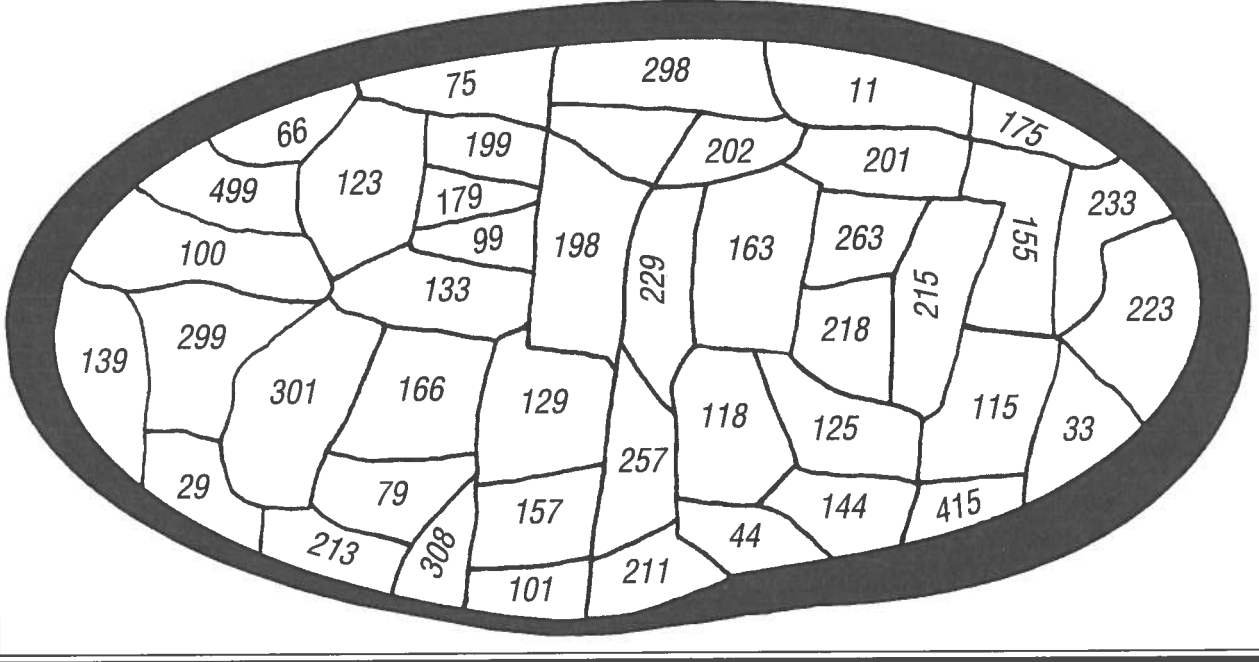
9.
$$\begin{array}{r} 99 \\ + 34 \\ \hline \end{array}$$

10.
$$\begin{array}{r} 20 \\ + 98 \\ \hline \end{array}$$

11.
$$\begin{array}{r} 99 \\ + 100 \\ \hline \end{array}$$

12.
$$\begin{array}{r} 99 \\ + 30 \\ \hline \end{array}$$

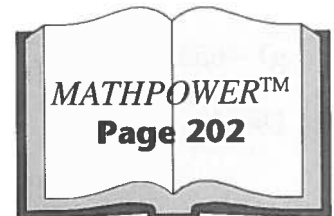
Shade each answer in the egg below to find how many degrees are in a right angle.



GETTING STARTED



Work together with your classmates, using your *MATHPOWER*TM student text, page 202.



Warm Up

1. Write in standard form.

Example: six and twenty seven hundredths → 6.27

a) four thousand twenty and five tenths → _____

b) sixteen and forty-four hundredths → _____

c) five hundred eighty-seven thousandths → _____

d) six thousand eight hundred thirty-five → _____

2. Write in words.

Example: 3.6 → three and six tenths

- a) 112.7 → _____
- b) 2036.08 → _____
- c) 59.008 → _____
- d) 0.345 → _____
- e) 3.62 → _____

3. Round to the given place value.

- a) 14.69 to the nearest tenth → _____
- b) 8.423 to the nearest hundredth → _____
- c) 55.068 to the nearest tenth → _____



4. Multiply.

When multiplying by 10, 100, 1000, ..., move the decimal to the right.

- a) $5.68 \times 10 =$ _____
- b) $45.03 \times 100 =$ _____
- c) $0.036 \times 1000 =$ _____
- d) $84.557 \times 10 =$ _____

When multiplying by 0.1, 0.01, 0.001, ..., move the decimal to the left.

- e) $18.6 \times 0.1 =$ _____
- f) $2.73 \times 0.01 =$ _____
- g) $4652 \times 0.001 =$ _____
- h) $52.09 \times 0.01 =$ _____



NO CALCULATOR

5. Divide.

When dividing by 10, 100, 1000, ..., move the decimal to the left.

- a) $2.76 \div 100 =$ _____
- b) $38.165 \div 10 =$ _____
- c) $2.6 \div 100 =$ _____
- d) $562.19 \div 1000 =$ _____

When dividing by 0.1, 0.01, 0.001, ..., move the decimal to the right.

- e) $19.35 \div 0.1 =$ _____
- f) $7.8 \div 0.01 =$ _____
- g) $42.06 \div 0.01 =$ _____
- h) $246.115 \div 0.001 =$ _____

6. Calculate.

BEDMAS

Remember:
First → multiply and divide
Then → add and subtract

a) $15.73 + 28.04 + 21.98 =$

b) $4 \times 9.86 =$

c) $2 \times 12.3 + 2 \times 16.9 =$ _____

d) $15.4 \times 27.6 - 9.2 \times 10.8 =$ _____

= _____ + _____

= _____ - _____

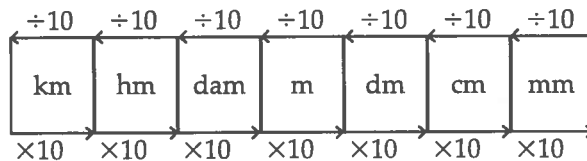
=

=

e) $3.14 \times 12.5 =$

f) $218.858 \div 3.14 =$

Mental Math



NO CALCULATOR

1. Express in millimetres.

a) $5 \text{ cm} =$ **mm**

b) $16 \text{ cm} =$ _____

c) $0.2 \text{ cm} =$ _____

$5 \text{ cm} = 5 \times 10$

$=$ **mm**

d) $2 \text{ m} =$ **mm**

e) $0.3 \text{ m} =$ _____

f) $1.16 \text{ m} =$ _____

$2 \text{ m} = 2 \times 10 \times 10 \times 10$

$=$ **mm**

2. Express in centimetres.

a) $4 \text{ m} =$ **cm**

b) $25 \text{ m} =$ _____

c) $1.7 \text{ m} =$ _____

$4 \text{ m} = 4 \times 10 \times 10$

$=$ **cm**

d) $38 \text{ mm} =$ _____

e) $36 \text{ mm} =$ _____

f) $112 \text{ mm} =$ _____

$38 \text{ mm} = 38 \div 10$

$=$ **cm**

3. Express in metres.

a) $240 \text{ cm} =$ _____

b) $516 \text{ cm} =$ _____

c) $24 \text{ cm} =$ _____

$240 \text{ cm} = 240 \div 10 \div 10$

$=$ **m**

Continues on next page. →

d) $1500 \text{ mm} = \boxed{} \text{ m}$ e) $625 \text{ mm} = \underline{\hspace{2cm}}$ f) $52 \text{ mm} = \underline{\hspace{2cm}}$

$1500 \text{ mm} = 1500 \div 10 \div 10 \div 10$
 $= \boxed{} \text{ m}$

g) $4 \text{ km} = \underline{\hspace{2cm}}$ h) $0.5 \text{ km} = \underline{\hspace{2cm}}$ i) $6.3 \text{ km} = \underline{\hspace{2cm}}$

$4 \text{ km} = 4 \times 10 \times 10 \times 10$
 $= \boxed{} \text{ m}$

4. Express in kilometres.

a) $8000 \text{ m} = \boxed{} \text{ km}$ b) $982 \text{ m} = \underline{\hspace{2cm}}$ c) $46 \text{ m} = \underline{\hspace{2cm}}$

$8000 \text{ m} = 8000 \div 10 \div 10 \div 10$
 $= \boxed{} \text{ km}$



NO CALCULATOR

5. Calculate.

Move the decimal to the right.

a) $26 \times 100 = \underline{\hspace{2cm}}$ b) $0.5 \times 10 = \underline{\hspace{2cm}}$ c) $3.4 \times 1000 = \underline{\hspace{2cm}}$

d) $7.9 \times 100 = \underline{\hspace{2cm}}$ e) $0.2 \times 1000 = \underline{\hspace{2cm}}$ f) $372.1 \times 10 = \underline{\hspace{2cm}}$

Move the decimal to the left.

g) $789.4 \div 1000 = \underline{\hspace{2cm}}$ h) $47 \div 10 = \underline{\hspace{2cm}}$ i) $326 \div 100 = \underline{\hspace{2cm}}$

j) $59.8 \div 100 = \underline{\hspace{2cm}}$ k) $2.73 \div 10 = \underline{\hspace{2cm}}$ l) $12 \div 1000 = \underline{\hspace{2cm}}$

Skill Builder

1. Calculate the square of each number.

Example: Find the square of 11.

$11^2 = 11 \times 11$
 $= 121$

a) $7 \rightarrow \underline{\hspace{2cm}}$ b) $1 \rightarrow \underline{\hspace{2cm}}$

$7^2 = \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}$
 $= \underline{\hspace{2cm}}$

c) $9 \rightarrow \underline{\hspace{2cm}}$ d) $3 \rightarrow \underline{\hspace{2cm}}$ e) $6 \rightarrow \underline{\hspace{2cm}}$ f) $5 \rightarrow \underline{\hspace{2cm}}$

2. Find the square root of each number.

Example: Find the square root of 64.

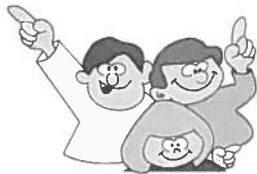
$\sqrt{64} = \sqrt{8 \times 8}$
 $= 8$

a) $16 \rightarrow \underline{\hspace{2cm}}$ b) $100 \rightarrow \underline{\hspace{2cm}}$

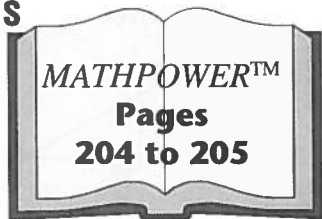
$\sqrt{16} = \sqrt{4 \times 4}$
 $= \underline{\hspace{2cm}}$

c) $81 \rightarrow \underline{\hspace{2cm}}$ d) $4 \rightarrow \underline{\hspace{2cm}}$ e) $25 \rightarrow \underline{\hspace{2cm}}$ f) $9 \rightarrow \underline{\hspace{2cm}}$

LEARNING TOGETHER Investigating Right Triangles



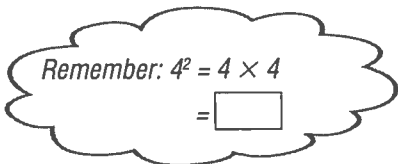
Work together with your classmates, using your **MATHPOWER™** student text, pages 204 and 205.



Skill Builder

1. Round each of the following to the given place value in the brackets. Circle the correct answer.

- | | | |
|-------------------|------------------------|-----------------------|
| a) 367.85 (tenth) | b) 0.0062 (thousandth) | c) 47.355 (hundredth) |
| 367.8 367.9 | 0.006 0.01 | 47.4 47.36 |
| d) 852 (hundred) | e) 4.903 (ones) | f) 723.4 (tens) |
| 800 900 | 4.9 5 | 720 723 |



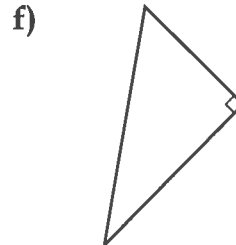
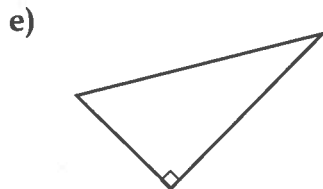
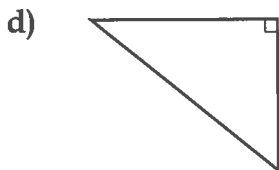
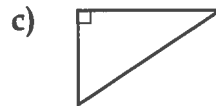
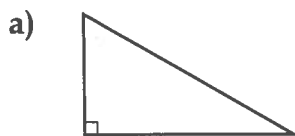
2. Calculate.

- | | | |
|------------------|-------------------|------------------|
| a) $4^2 =$ _____ | b) $7^2 =$ _____ | c) $3^2 =$ _____ |
| d) $8^2 =$ _____ | e) $10^2 =$ _____ | f) $9^2 =$ _____ |
| g) $1^2 =$ _____ | h) $2^2 =$ _____ | i) $5^2 =$ _____ |

7.1 The Pythagorean Theorem

Practice

1. For each of the following triangles, place the letter *h* on the side that is the hypotenuse.



2. Find the length of the unknown side in each right triangle. If necessary, round to one decimal place.



a)

$c^2 = a^2 + b^2$
 $x^2 = 5^2 + 12^2$
 $x^2 = 25 + \square$
 $x^2 = \square$
 $x = \sqrt{\square}$
 $x = \underline{\hspace{2cm}}$

b)

Formula
Substitute
Do exponents
Add
Find square root

$c^2 = a^2 + b^2$
 $x^2 = \square + \square$
 $x^2 = \square + \square$
 $x^2 = \square$
 $x = \sqrt{\square}$
 $x = \underline{\hspace{2cm}}$

The length of the unknown

The length of the unknown

side is .

side is .



c)

d)

Round your answer to one decimal place.

3. Find the length of the unknown side in each right triangle. If necessary, round to one decimal place.

When given the hypotenuse, use one of the following formulas to find the unknown side. $a^2 = c^2 - b^2$ or $b^2 = c^2 - a^2$.



a)

$b^2 = c^2 - a^2$
 $x^2 = 17^2 - 8^2$
 $x^2 = \square - \square$
 $x^2 = \square$
 $x = \sqrt{\square}$
 $x = \underline{\hspace{2cm}}$

b)

Formula
Substitute
Do exponents
Subtract
Find square root

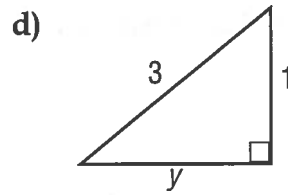
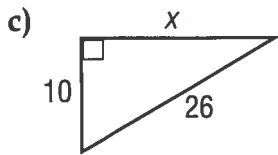
$a^2 = c^2 - b^2$
 $t^2 = \square - \square$
 $t^2 = \square - \square$
 $t^2 = \square$
 $t = \sqrt{\square}$
 $t = \underline{\hspace{2cm}}$

The length of the unknown

The length of the unknown

side is .

side is .



Skill Builder

Find the square root.

A. 25

Q. 9

C. 64

R. 49

E. 36

U. 16

S. 100

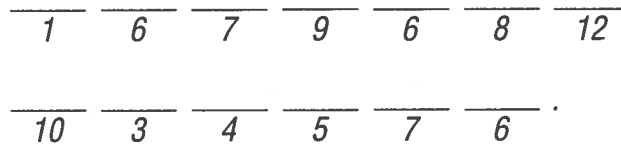
T. 144

P. 1

F. 81

To complete the sentence below, place the letter on the blank above the matching answer.

Each of the numbers is a

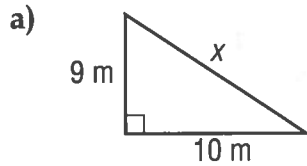


7.2 Using the Pythagorean Theorem

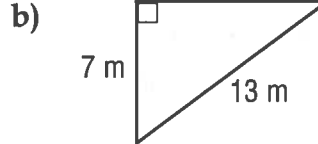
Practice

1. Find the length, in metres, of the third side of each right triangle.

Round to one decimal place.



$$c^2 = a^2 + b^2$$



$$b^2 = c^2 - a^2$$

Formula

Substitute

Do exponents

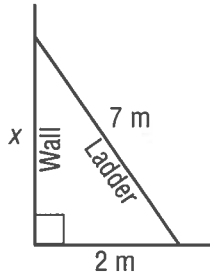
Add or subtract

Find square root

$x \doteq$ m

Problems and Applications

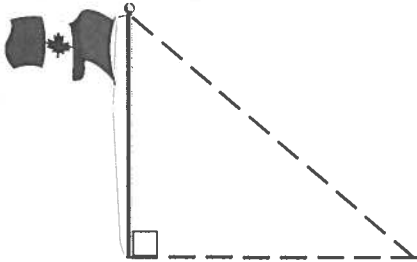
2. A 7 m ladder is leaning against a wall of a building. The bottom of the ladder is 2 m from the bottom of the building. How far up the building is the top of the ladder?



$$a^2 = c^2 - b^2 \quad \text{Formula}$$

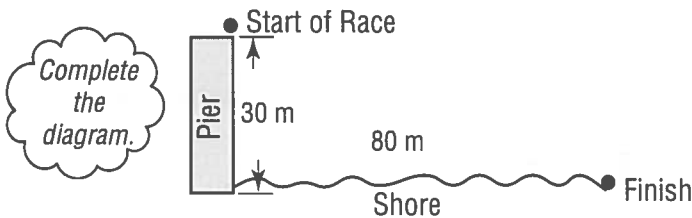
Sentence: _____

3. A 12 m cable is attached to the top of a flagpole and a stake in the ground. The stake is 5 m from the flagpole. How tall is the flagpole? Round to one decimal place.



Sentence: _____

4. At a lake, a swimming race starts from the end of a pier 30 m in length. The finish point is on the shore, 80 m away from the bottom of the pier. How long is the race? Round to the nearest metre.



Sentence: _____

Logic
Zapper

1

2

3

4

5

6

Place the 6 numbered blocks in two piles of 3 blocks each. A block with a higher number **cannot** be above a block with a lower number.

Example:

3	1
4	2
5	6

Skill Builder

1. Add.

a)
$$\begin{array}{r} 3.6 \\ 4.5 \\ \hline 8.9 \\ \hline \end{array}$$

b)
$$\begin{array}{r} 6.4 \\ 5.8 \\ \hline 10.7 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 14.3 \\ 16.9 \\ \hline 12.0 \\ \hline \end{array}$$

d)
$$\begin{array}{r} 1.9 \\ 1.8 \\ 2.7 \\ \hline 3.8 \\ \hline \end{array}$$

e)
$$\begin{array}{r} 7.4 \\ 6.4 \\ 1.0 \\ \hline 10.7 \\ \hline 4.6 \\ \hline \end{array}$$

NO CALCULATOR

2. Match each question with the correct answer.

- | | |
|-----------------------------|------|
| a) $6 \times 3 \times 10$ | 27 |
| b) $7 \times 2 \times 10$ | 80 |
| c) $3 \times 3 \times 3$ | 25 |
| d) $5 \times 4 \times 4$ | 180 |
| e) $2 \times 2 \times 6$ | 90 |
| f) $10 \times 9 \times 1$ | 48 |
| g) $4 \times 2 \times 2$ | 140 |
| h) $5 \times 5 \times 1$ | 16 |
| i) $2 \times 4 \times 6$ | 1000 |
| j) $10 \times 10 \times 10$ | 24 |

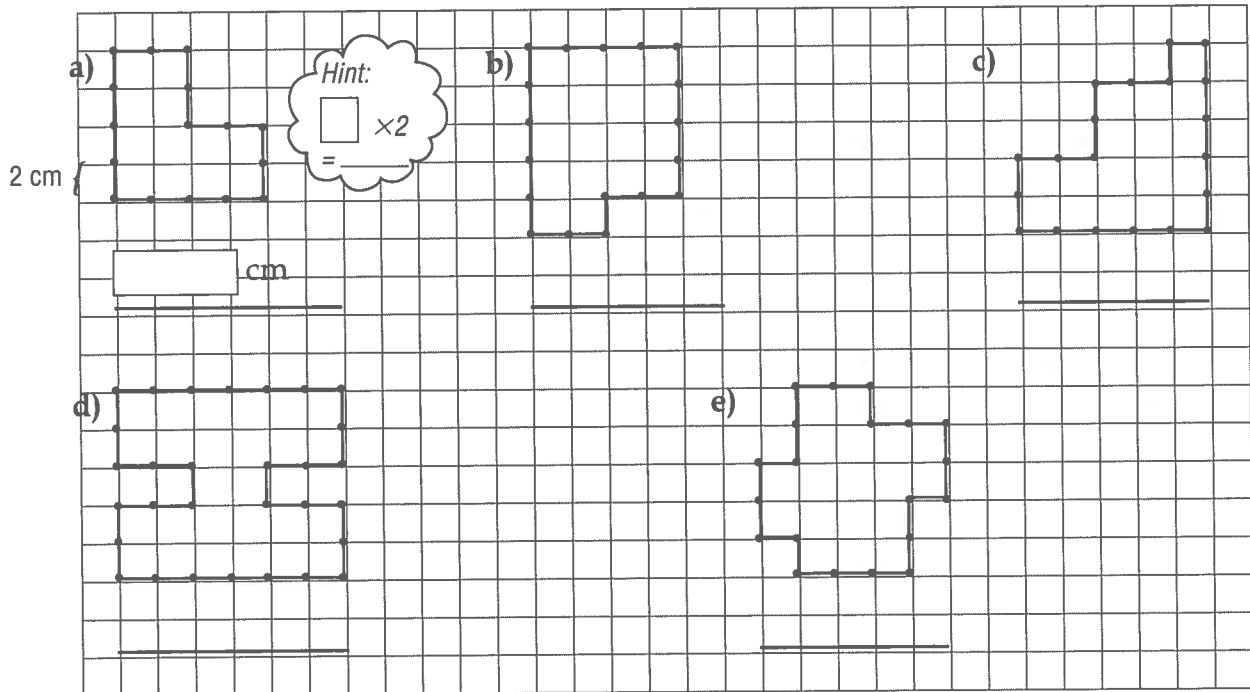
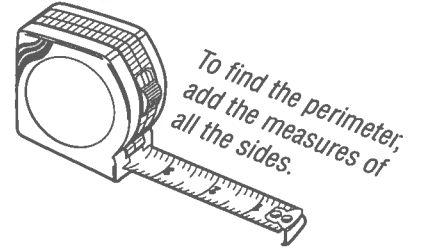


7.3 Perimeter

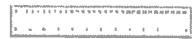
Practice

1. Find the perimeter of each figure.

The distance between two points on the grid is 2 cm.

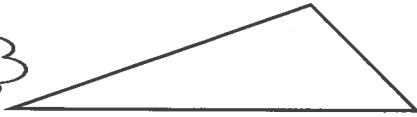


2. Estimate the perimeter of each figure. Measure each side of the figure. Calculate the perimeter of each figure.



a)

First, estimate the length of each side.



Est. _____ + _____ + _____ = _____

Measure: _____ + _____ + _____ = _____

b)

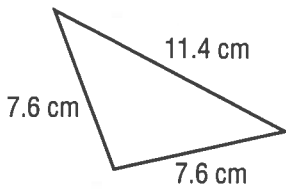


Est. _____

Measure: _____

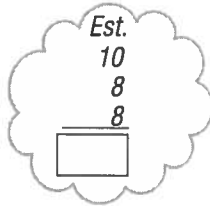
3. Estimate, then calculate the perimeter of each figure.

a)

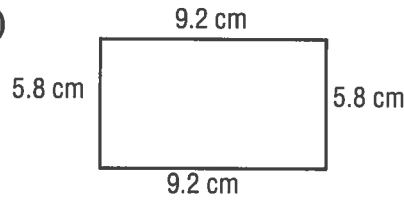


$P = 7.6 + 11.4 + 7.6$

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



b)

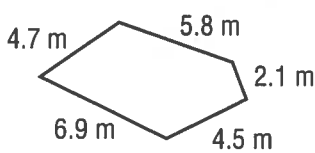


$P = 9.2 + \square + \square + \square$

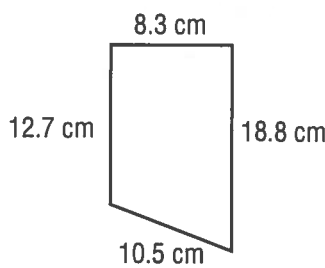
$P = \underline{\hspace{2cm}}$



c)



d)

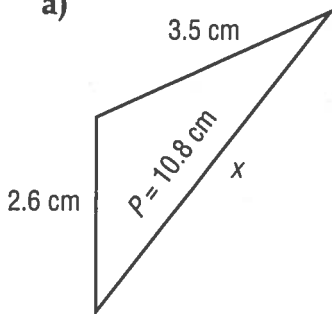


Remember to include units.

Problems and Applications

4. Calculate each missing length.

a)



Substitute.

Add like terms.

Add -6.1.

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

$10.8 = 2.6 + 3.5 + x$

$10.8 = \square + x$

$\underline{-6.1 = -6.1}$

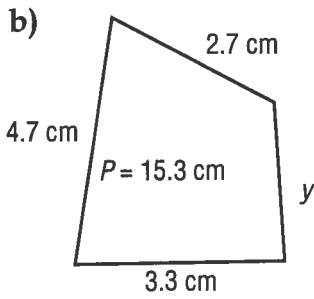
$\square = x$

OR

$x = \square$

The missing side is \square cm.

Find the missing side.



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

$$15.3 = \square + \square + \square + \square$$

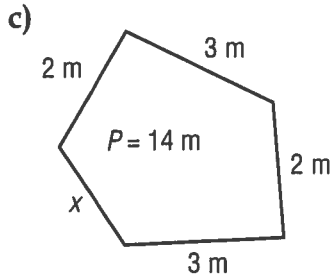
Substitute

Add like terms

Add

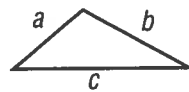


Sentence: _____



Sentence: _____

5. Complete the table.



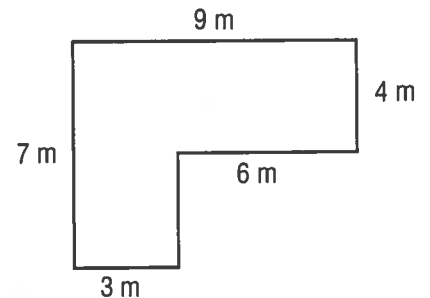
$$P = a + b + c$$

	<i>a</i>	<i>b</i>	<i>c</i>	<i>P</i>
a)	1.5	1.3	1.2	
b)	2.1	1.6	2.5	
c)	4		5	14
d)		4	5	13

Rough Work:

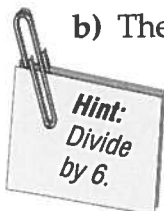
6. A wallpaper border will be put around the top of the walls of a hallway.

a) What length of border will be needed?



Sentence: _____

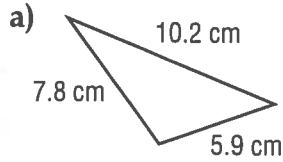
b) The border is sold in 6 m rolls. How many rolls will be needed?



Sentence: _____

Skill Builder

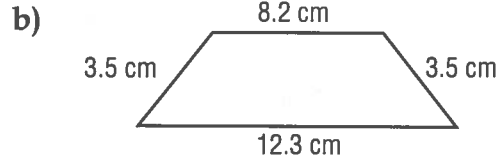
1. Calculate each perimeter.



$P = \text{sum of all sides}$

$P = \underline{\quad} + \underline{\quad} + \underline{\quad}$

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



2. Subtract.

a)
$$\begin{array}{r} 165 \\ -99 \\ \hline \end{array}$$

b)
$$\begin{array}{r} 342 \\ -99 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 602 \\ -99 \\ \hline \end{array}$$

d)
$$\begin{array}{r} 111 \\ -99 \\ \hline \end{array}$$

e)
$$\begin{array}{r} 276 \\ -99 \\ \hline \end{array}$$

f)
$$\begin{array}{r} 545 \\ -99 \\ \hline \end{array}$$

g)
$$\begin{array}{r} 215 \\ -99 \\ \hline \end{array}$$

h)
$$\begin{array}{r} 485 \\ -99 \\ \hline \end{array}$$

i)
$$\begin{array}{r} 198 \\ -99 \\ \hline \end{array}$$

j)
$$\begin{array}{r} 100 \\ -99 \\ \hline \end{array}$$



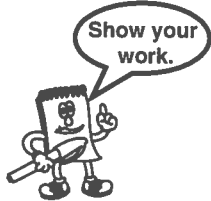
NO CALCULATOR

7.4 Perimeters of Polygons

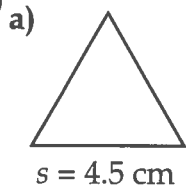
Practice

Perimeter = number of sides \times length of side

1. Find the perimeter of each regular polygon.



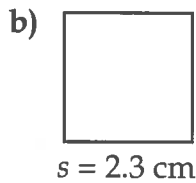
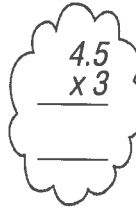
Show your work.



$P = \text{number of sides} \times \text{length of a side}$

$P = 3 \times 4.5$

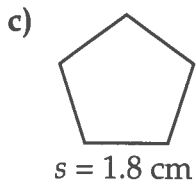
$P = \underline{\hspace{2cm}}$ cm



$P = 4 \times s$

$P = 4 \times \square$

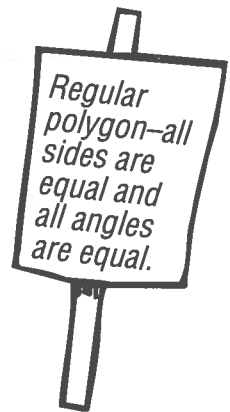
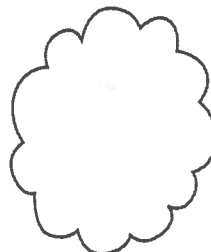
$P = \underline{\hspace{2cm}}$ cm



$P = \square \times s$

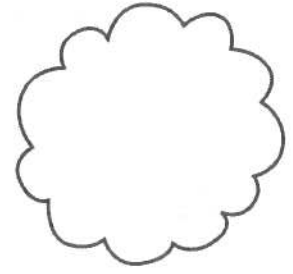
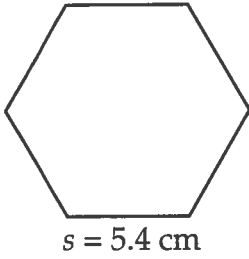
$P = \square \times \text{pentagon}$

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

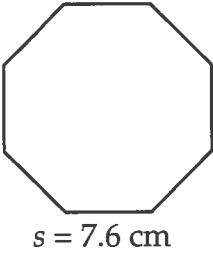


Find the **perimeter** of each regular polygon.

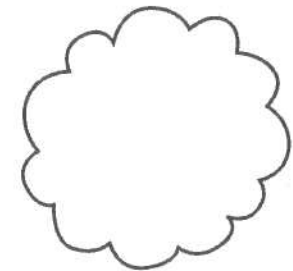
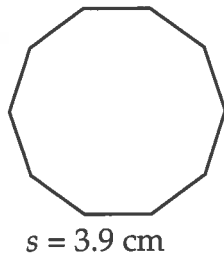
d)



e)

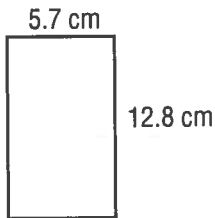


f)



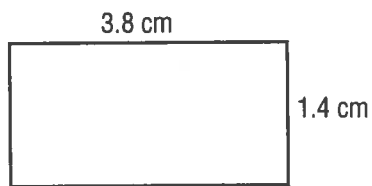
2. Calculate the **perimeter** of each rectangle.

a)



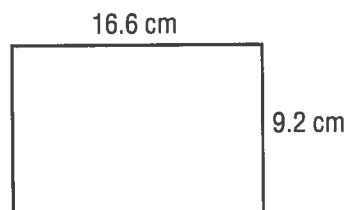
Formula	$P = 2 \times l + 2 \times w$
Substitute	$= 2 \times 5.7 + 2 \times 12.8$
Multiply	$= \underline{\quad\quad} + \underline{\quad\quad}$
Add	$= \underline{\quad\quad} \text{ cm}$

b)



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

c)

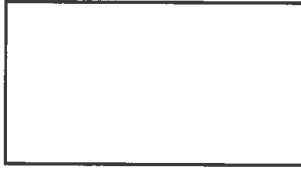


Problems and Applications

3. To warm up before a practice, the soccer coach has the team members run around the field 2 times. The length of the field is 100 m and the width is 73 m. How far does each team member run?



Diagram:



Sentence: _____

4. Find the perimeter of each *regular polygon*.

Draw the figure first.

- a) square, each side is 8.3 m

Diagram

$$\begin{aligned} P &= 4 \times s \\ &= 4 \times \square \\ &= \underline{\hspace{2cm}} \end{aligned}$$

- b) triangle, each side is 7.4 cm

Diagram

- c) hexagon, each side is 9.4 cm

Diagram

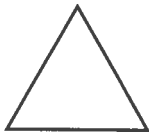
- d) octagon, each side is 5.2 cm

Diagram

Hint:
Hexagon
• 6 sides
Octagon
• 8 sides

5. Find the *length* of the side of each *regular polygon*.

- a) triangle, perimeter is 21 cm



$$\begin{aligned} P &= 3 \times s \\ 21 &= 3 \times s \\ \frac{21}{3} &= \frac{3}{3} \times s \end{aligned}$$

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

Formula

Substitute

Divide both sides by the same number.

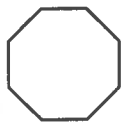
- b) square, perimeter is 24 m

Skill Builder

1. Calculate the perimeter of each regular polygon.

a) octagon, sides 4.1 cm

b) pentagon, sides 4 cm



$$P = 8s$$

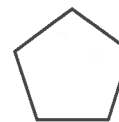
Formula

$$P = 8 \times \underline{\hspace{2cm}}$$

Substitute

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

Multiply



c) square, sides 3.9 cm

d) triangle, sides 7.7 cm

2. Calculate.

a) $4^2 = \underline{\hspace{2cm}}$

4×4

b) $7^2 = \underline{\hspace{2cm}}$

c) $2^2 = \underline{\hspace{2cm}}$

d) $6^2 = \underline{\hspace{2cm}}$

e) $9^2 = \underline{\hspace{2cm}}$

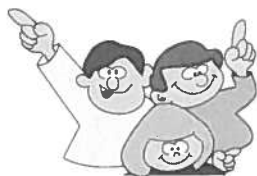
f) $10^2 = \underline{\hspace{2cm}}$

g) $1^2 = \underline{\hspace{2cm}}$

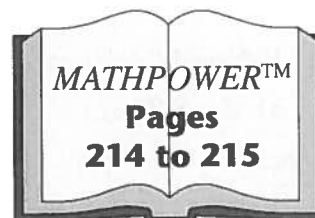
h) $3^2 = \underline{\hspace{2cm}}$

NO CALCULATOR

LEARNING TOGETHER Investigating Geometric Constants



Work together with your classmates, using your *MATHPOWER*TM student text, pages 214 and 215.



Skill Builder

1. Multiply. Round each answer to the nearest hundredth (2 decimal places).

a)
$$\begin{array}{r} 6.87 \\ \times 4.5 \\ \hline \end{array}$$

b)
$$\begin{array}{r} 3.14 \\ \times 7.4 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 4.08 \\ \times 2.9 \\ \hline \end{array}$$

d)
$$\begin{array}{r} 14.21 \\ \times 9.6 \\ \hline \end{array}$$

↓

↓

↓

↓

Round answer to 2 decimal places.

2. Add.

a)
$$\begin{array}{r} 5000 \\ + 4500 \\ \hline \end{array}$$

b)
$$\begin{array}{r} 600 \\ + 700 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 8000 \\ + 430 \\ \hline \end{array}$$

d)
$$\begin{array}{r} 7000 \\ + 2100 \\ \hline \end{array}$$

e)
$$\begin{array}{r} 400 \\ + 3000 \\ \hline \end{array}$$

f)
$$\begin{array}{r} 1000 \\ + 2200 \\ \hline \end{array}$$

g)
$$\begin{array}{r} 900 \\ + 4000 \\ \hline \end{array}$$

h)
$$\begin{array}{r} 6000 \\ + 2000 \\ \hline \end{array}$$

7.5 Circumference of a Circle

$\pi \approx 3.14$

Diameter is double the radius.

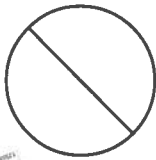
Round each answer to the nearest hundredth (2 decimal places), if necessary.

Practice

1. Measure each radius or diameter and calculate the circumference of each circle.



a)



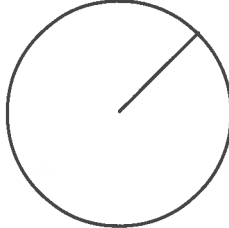
$$d = \underline{\hspace{2cm}}$$

$$C = \pi \times d$$

$$= 3.14 \times \boxed{\hspace{1cm}}$$

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

b)



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

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

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

Formula

Substitute

Multiply

2. Estimate, then calculate the circumference of each circle.

a) $d = 8.35 \text{ cm}$

Formula

Substitute

Multiply

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

$$= 3.14 \times \boxed{\hspace{1cm}}$$

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

Est.

$C = 3 \times 8$

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

b) $d = 15 \text{ cm}$

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

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

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

Est.

c) $d = 19.2 \text{ cm}$

Est.

d) $d = 5.6 \text{ m}$

Est.

e) $r = 23 \text{ cm}$

The diameter is twice the radius.
 $d = 2 \times r$

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

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

$$C = \pi \times d$$

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

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

Est.

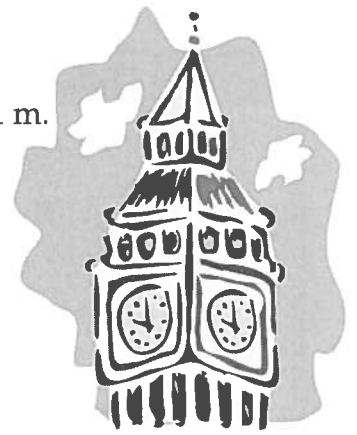
f) $r = 5.3 \text{ cm}$

Est.

Problems and Applications


3. The diameter of the clock face of Big Ben in London, England, is 7.1 m.
What is the circumference of the clock face?

Formula _____
Substitute _____
Multiply _____




Sentence: _____

4. How much longer is the circumference of a quarter than the circumference of a dime?



Quarter




$d = 23.9 \text{ mm}$

Formula _____

Substitute _____

Multiply _____

Dime



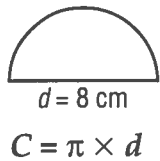
$d = 18 \text{ mm}$

Subtract the circumferences.

Sentence: _____

5. Calculate the *perimeter* of each figure.

a)



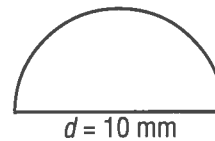
$$= \text{_____} \times \text{_____}$$

$$= \text{_____}$$

$$\frac{1}{2} \text{ of the circumference} = \frac{C}{2}$$

$$= \frac{\text{_____}}{2}$$

b)



To find the perimeter of : = _____

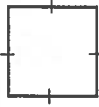
Add: $\rightarrow d + \frac{1}{2} \text{ of } C$

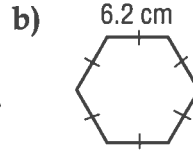
$$= \text{_____} + \text{_____}$$

$$= \text{_____}$$

Skill Builder

1. Calculate the perimeter of each figure.

a)  $P = \square \times s$ *Formula*
 $= \square \times \square$ *Substitute*
 $= \square$ *Multiply*



2. Calculate the perimeter of each circle.

a) diameter of 2.5 cm

$$C = \pi \times d$$

b) radius of 4 cm

$$d = 2 \times r$$

LEARNING TOGETHER Area

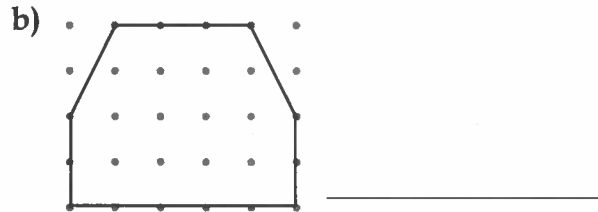
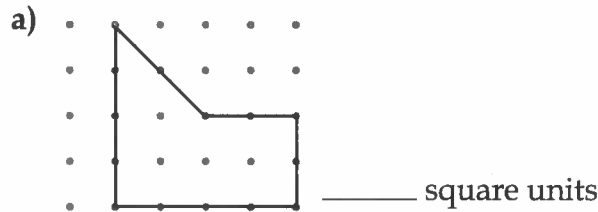


Work together with your classmates, using your **MATHPOWER™** student text, pages 218 and 219.

MATHPOWER™
Pages
218 to 219

Skill Builder

1. What is the area of each figure in square units?



2. Match each question in Column A with the correct answer in Column B. Connect with lines.

Column A

- 0.3×0.5
- 0.8×0.6
- 0.1×8
- 0.2×0.9
- 0.7×0.6
- 0.2×0.3
- 0.6×0.5
- 0.2×0.4
- 0.7×0.3
- 0.4×0.3

Column B

- 0.18
- 0.3
- 0.15
- 0.12
- 0.08
- 0.48
- 0.8
- 0.42
- 0.06
- 0.21



Rough Work:

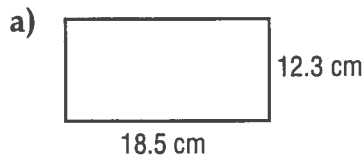
$$\begin{array}{r} 0.3 \\ \times 0.5 \\ \hline \end{array}$$

7.6 Area of a Rectangle and Square

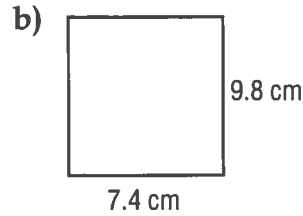
Practice

$$A = l \times w$$

1. Estimate, then calculate the area of each rectangle.



Est.
 $A = 20 \times 10$
 $A = \underline{\quad} \text{ cm}^2$



Est.

$$A = l \times w$$

$$= 18.5 \times \square$$

$$= \underline{\quad} \text{ cm}^2$$

Formula

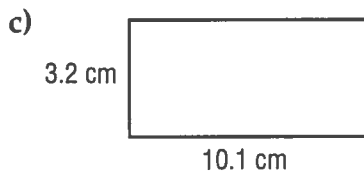
Substitute

Multiply

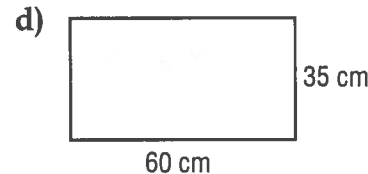
$$A = \underline{\quad} \times \underline{\quad}$$

$$= \underline{\quad} \times \underline{\quad}$$

$$= \underline{\quad} \text{ cm}^2$$

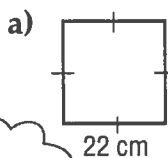


Est.

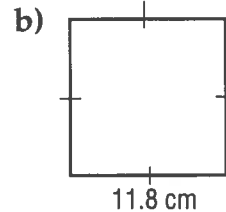


Est.

2. Estimate, then calculate the area of each square.



Est.
 $A = 20 \times 20$
 $A = \underline{\quad} \text{ cm}^2$



Est.

"s" means length of side.

$$A = s \times s$$

$$= \underline{\quad} \times \underline{\quad}$$

$$= \underline{\quad} \text{ cm}^2$$

OR

$$A = s^2$$

$$= 22^2$$

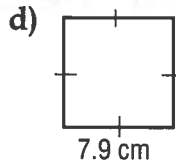
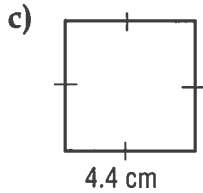
$$= \underline{\quad}$$

Formula

Substitute

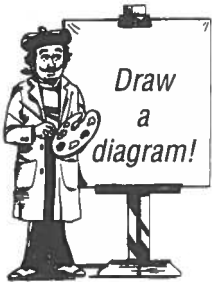
Multiply

Calculate the area of each square.



Problems and Applications

3. The Imperial Palace in Beijing, China, is 960 m long and 750 m wide.
What is the area of the palace?



Formula

Substitute

Multiply



Sentence: _____

4. The perimeter of a square play area is 36 m.
a) What is the length of each side?

Hint: $P = 4s$

$$36 = 4s$$

Divide both sides by 4.

$$\frac{36}{4} = \frac{4s}{4}$$

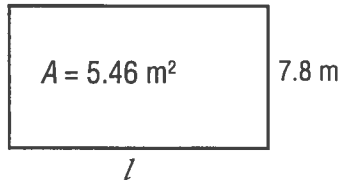
$$s = \boxed{}$$

- b) What is the area?

$A = s^2$

Sentence: _____

5. The area of a rectangular pathway is 5.46 m^2 . The width is 7.8 m.
How long is the pathway?



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

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

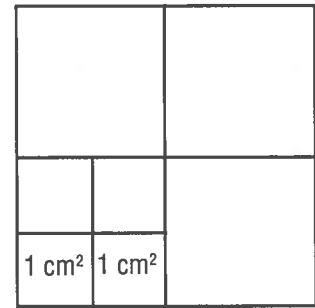
Divide both sides by 7.8

Sentence: _____



The area of each of the smallest squares is 1 cm^2 .

- a) Calculate the area of each of the other squares.



- b) The area of the largest square is _____.

Skill Builder

1. Calculate the area of each rectangle.

- a) length is 2 cm
width is 8 cm

$$A = l \times w$$

Formula

Substitute

Multiply

- b) length is 8 cm
width is 7 cm

- c) length is 25.6 cm
width is 8.4 cm

- d) length is 3.8 cm
width is 2.5 cm

2. Simplify. Leave your answer in exponential form.

a) $3^2 \times 3^3 = 3^{\square}$

b) $4^6 \div 4^2 =$

c) $2^4 \times 2^3 =$

d) $(6^3)^2 =$

e) $9^6 \times 9 =$

f) $4^6 \div 4 =$

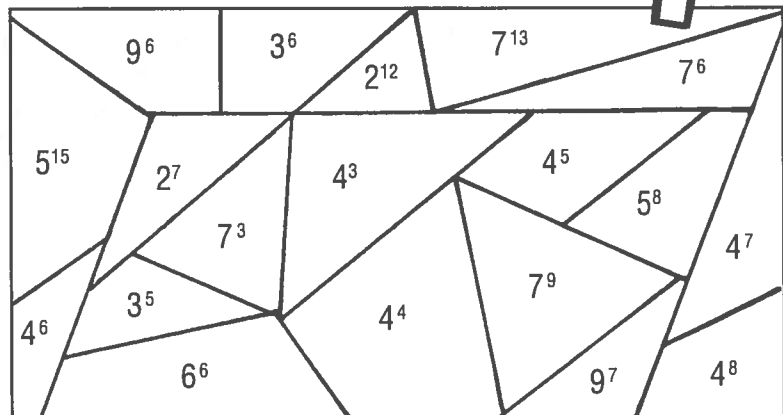
g) $5^3 \times 5^5 =$

h) $7^8 \div 7^5 =$

i) $(7^3)^3 =$

j) $4^5 \div 4^2 =$

In the diagram at the right, colour in the spaces that have the above answers. What shape appears?

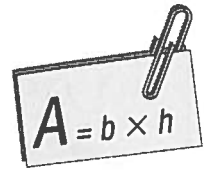


Remember:

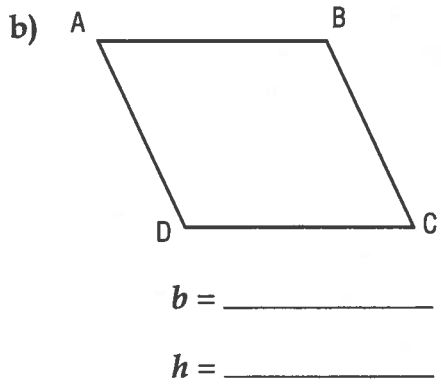
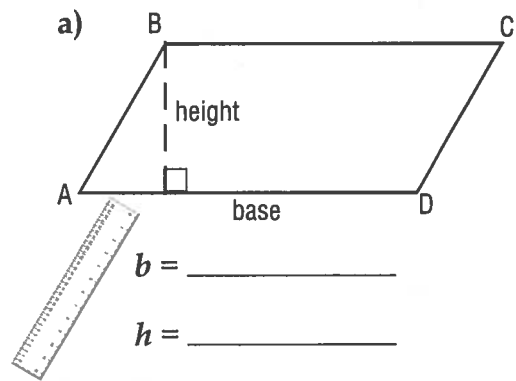
- $3^4 \times 3^2 = 3^{4+2} = 3^6$
- $3^9 \div 3^2 = 3^{9-2} = 3^7$
- $(3^4)^2 = 3^{4 \times 2} = 3^8$

7.7 Area of a Parallelogram

Practice



1. Measure the base and the height of each parallelogram. Then, calculate the area.



$A = b \times h$

Formula

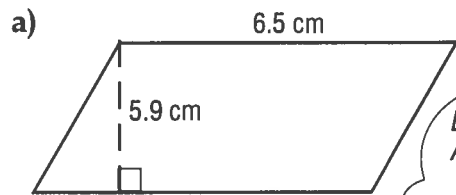
$= \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}$

Substitute

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

Multiply

2. Estimate, then calculate the area of each parallelogram.



Est.
 $A = 6 \times 6$
 $A = \underline{\hspace{1cm}} \text{ cm}^2$

$A = b \times h$

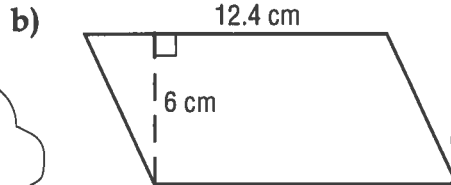
Formula

$= 6.5 \times 5.9$

Substitute

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

Multiply

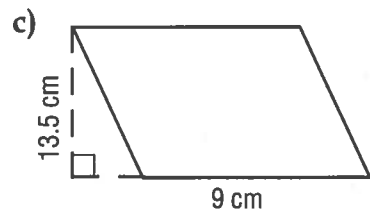


Est.

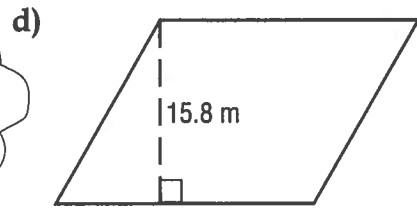
$A = \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}$

$= 12.4 \times \underline{\hspace{1cm}}$

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



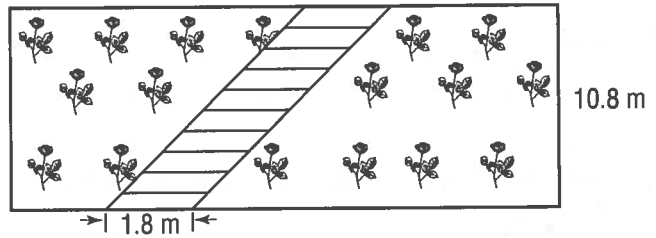
Est.



Est.

Problems and Applications

3. The path cuts through a rose garden.
What is the area of the path?



Formula

Substitute

Multiply

Sentence: _____

Skill Builder

1. Draw each of the following.



- a) a right angle

equal to 90°

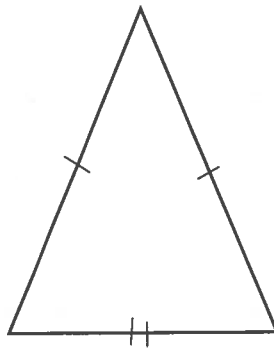
- b) an acute angle

less than 90°

- c) a reflex angle

more than 180° but
less than 360°

2. Draw the line of symmetry.



Draw a line
that cuts the
figure exactly
in half.

3. Continue each pattern for 2 more numbers.

a) 1, 2, 3, _____, _____.

b) 4, 7, 10, _____, _____.

c) 4, 8, 16, _____, _____.

d) 1, 3, 9, _____, _____.

e) 48, 24, 12, _____, _____.

f) 100, 200, 400, _____, _____.

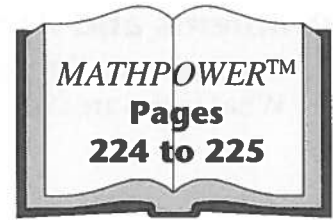
g) 33, 30, 27, _____, _____.

h) 10 000, 1000, 100, _____, _____.

LEARNING TOGETHER Seven-Point Geometry

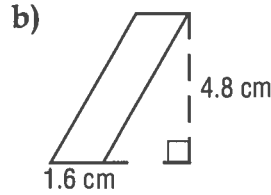
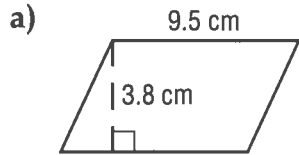


Work together with your classmates, using your MATHPOWER™ student text, pages 224 and 225.



Skill Builder

1. Calculate the area of each parallelogram.



$$A = b \times h$$

Formula

Substitute

Multiply

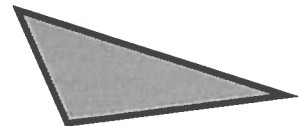
2. Calculate.

Hint: $\sqrt{81} = \sqrt{9 \times 9}$
 $= 9$

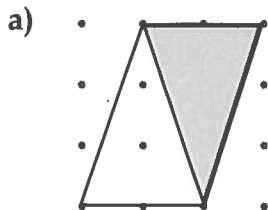


- a) $\sqrt{49} = \underline{\hspace{2cm}}$ b) $\sqrt{16} = \underline{\hspace{2cm}}$ c) $\sqrt{100} = \underline{\hspace{2cm}}$ d) $\sqrt{25} = \underline{\hspace{2cm}}$
 e) $\sqrt{64} = \underline{\hspace{2cm}}$ f) $\sqrt{900} = \underline{\hspace{2cm}}$ g) $\sqrt{9} = \underline{\hspace{2cm}}$ h) $\sqrt{400} = \underline{\hspace{2cm}}$

7.8 Area of a Triangle Practice

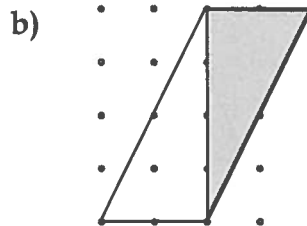


1. Find the area of each parallelogram and of each shaded triangle.



Area of parallelogram = $b \times h$
 $= \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}$
 $= \underline{\hspace{1cm}} \text{ units}^2$

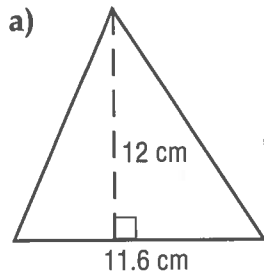
Area of triangle = $\frac{1}{2} \times \text{area of parallelogram}$
 $= \frac{1}{2} \times \underline{\hspace{1cm}}$
 $= \underline{\hspace{1cm}}$



Area of parallelogram = $\underline{\hspace{1cm}}$
 $= \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}$
 $= \underline{\hspace{1cm}}$

Area of triangle = $\frac{1}{2} \times \text{area of parallelogram}$
 $= \frac{1}{2} \times \underline{\hspace{1cm}}$
 $= \underline{\hspace{1cm}}$

2. Estimate, then calculate the area of each triangle.



Est.
 $A = \frac{1}{2} \times 10 \times 10$
 $A = \underline{\hspace{2cm}} \text{ cm}^2$

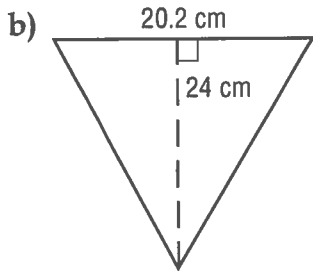
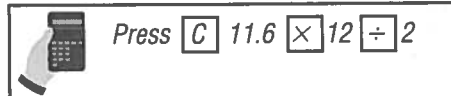
Formula
 Substitute
 Calculate

$$A = \frac{b \times h}{2}$$

$$= \frac{11.6 \times \square}{2}$$

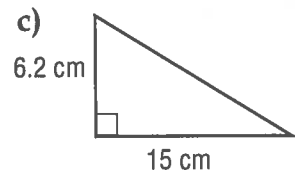
$$= \underline{\hspace{2cm}} \text{ cm}^2$$

Remember:
 $A = \frac{1}{2} \times b \times h$
 or $A = \frac{b \times h}{2}$



Est.
 $A = \frac{1}{2} \times 25 \times 20$
 $A = \underline{\hspace{2cm}}$

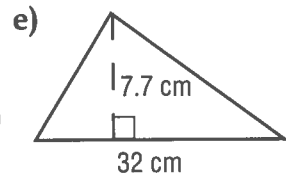
Formula
 Substitute
 Calculate



Est.



Est.



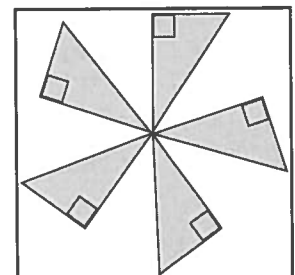
Est.

Problems and Applications

3. This section of a patchwork quilt has 5 triangles on it. The base of each triangle is 5.3 cm and the height is 3.6 cm.

a) What area of fabric is needed for 1 triangle?

b) What area of fabric is needed for 5 triangles?



Sentence: _____

Skill Builder

1. Calculate the area of each *parallelogram*.

a) $h = 4.5 \text{ cm}, b = 3.8 \text{ cm}$

b) $h = 7 \text{ cm}, b = 6 \text{ cm}$

$A = b \times h$

Formula

$= \underline{\quad} \times \underline{\quad}$

Substitute

$= \underline{\quad} \text{ cm}^2$

Multiply

2. Calculate the *circumference* of each circle.

a) $d = 3 \text{ cm}$

b) $r = 6 \text{ m}$

$C = \pi \times d$

Formula

$= 3.14 \times \underline{\quad}$

Substitute

$= \underline{\quad}$

Multiply

So, $d = 2 \times 6$

$= \underline{\quad}$

3. Tell whether each number is prime (P) or composite (C).

a) 5 _____

b) 17 _____

c) 40 _____

d) 16 _____

e) 45 _____

f) 25 _____

g) 2 _____

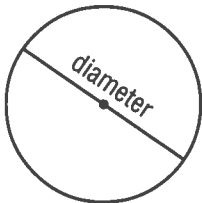
h) 11 _____

i) 51 _____

Remember:

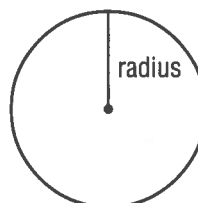
A prime number is one that is divisible only by itself and 1; e.g., 3 is prime.

7.9 Area of a Circle



Remember:
The radius is half the diameter.

$r = \frac{d}{2}$



$A = \pi r^2$

$\pi \doteq 3.14$

Practice

Round each answer to the nearest hundredth (2 decimal places).

1. Using a straight edge, measure the radius or diameter of each circle.

Then, calculate each area.

a)



$r = \underline{\quad}$

Measure

$A = \pi r^2$

$= 3.14 \times \underline{\quad}^2$

Formula

Substitute

$= 3.14 \times \underline{\quad} \times \underline{\quad}$

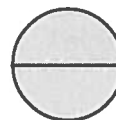
Square

$= 3.14 \times \underline{\quad}$

Multiply

$= \underline{\quad}$

b)



Measure

$d = \underline{\quad}$

$r = \frac{d}{2}$

$r = \underline{\quad}$

2. Estimate, then calculate the area of each circle.

a) radius is 4.8 cm

Formula $A = \pi \times r^2$
Substitute $= 3.14 \times 4.8^2$
Square $= 3.14 \times 4.8 \times \square$
Multiply $= \underline{\hspace{2cm}}$

Est. $A = 3 \times 5^2$
 $= 3 \times 25$
 $= \underline{\hspace{1cm}} \text{ cm}^2$

Press \square C \square 4.8 \square \times^2
 or
Press \square C \square 4.8 \square \times \square 4.8

b) radius is 12 cm

$A = \pi \times \underline{\hspace{1cm}}$
 $= 3.14 \times \underline{\hspace{1cm}}^2$
 $= 3.14 \times 12 \times \square$
 $= \underline{\hspace{2cm}}$

Est. $A = 3 \times 10^2$
 $= 3 \times \underline{\hspace{1cm}}$
 $= \underline{\hspace{1cm}} \text{ cm}^2$

c) radius is 3.6 m

Est.

d) radius is 21 cm

Est.

e) diameter is 16 cm

$r = \frac{d}{2}$ $r = \frac{16}{2}$
 $= \underline{\hspace{1cm}}$

Formula $A = \pi \times r^2$
Substitute $= \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}^2$
Square $= \underline{\hspace{1cm}} \times \square$
Multiply $= \underline{\hspace{2cm}}$

Est. $A = 3 \times 10^2$
 $= 3 \times \underline{\hspace{1cm}}$
 $= \underline{\hspace{1cm}} \text{ cm}^2$

f) diameter is 1.2 m

Est.

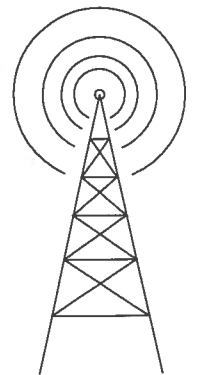
Problems and Applications

3. A radio station sends out sound waves approximately 80 km in all directions from the station. What is the area of the transmission circle covered by the sound waves?

Diagram:

Hint: $r = 80 \text{ km}$

- Formula**
- Substitute**
- Calculate**

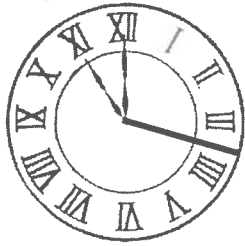


Sentence: _____

4. The world's largest clock face is on a floral clock in Toi, Japan. The clock face has a **radius** of 15.5 m. Calculate the area.



Diagram:



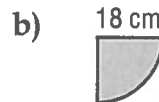
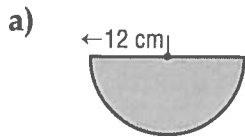
Formula

Substitute

Solve

Sentence: _____

5. Calculate the area of each shaded region.



First: Find the area of the whole circle.

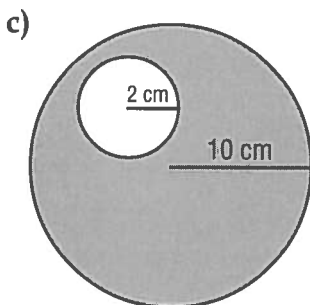
$$\begin{aligned}
 A &= \pi \times r^2 \\
 &= \text{_____} \times \text{_____} \\
 &= \text{_____}
 \end{aligned}$$

First: Find the area of the whole circle.

Second: To find the area of half of a circle, divide the area of the whole circle by 2.

Second: Divide the area by 4.

$$\begin{aligned}
 \text{Area of } \text{shaded semicircle} &= \frac{A}{2} \\
 &= \frac{\text{_____}}{2} \\
 &= \text{_____}
 \end{aligned}$$



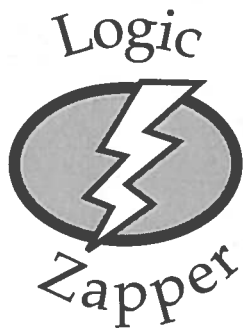
First: Find the area of the large circle.

Second: Find the area of the small circle.

Third: Subtract.

Shaded area = Area of large circle – Area of small circle

$$\begin{aligned}
 &= \text{_____} - \text{_____} \\
 &= \text{_____}
 \end{aligned}$$



What is the mystery number? To find the answer, use the following clues.

- a) It is less than 50, but greater than 30.
- b) It can be divided by 5.
- c) It can be divided by 7.



The number is _____.

Skill Builder

1. First: Draw and label a diagram of each figure.

Second: Calculate the area of each figure.

Formulas: $A = l \times w$ $A = b \times h$ $A = s^2$ $A = \frac{1}{2} \times b \times h$ $A = \pi \times r^2$

a) rectangle with $l = 8$ cm, $w = 2$ cm

b) a square with $s = 6$ cm

Diagram

Formula

Substitute

Calculate

c) parallelogram with
 $b = 2.1$ cm, $h = 4.6$ cm

d) triangle with
 $b = 9$ cm, $h = 7$ cm

e) circle with
 $r = 5$ cm



2. Find the missing factor.

a) $7 \times \square = 63$

b) $4 \times \square = 16$

c) $\square \times 6 = 30$

d) $10 \times \square = 40$

e) $\square \times 10 = 90$

f) $\square \times 8 = 48$

g) $\square \times 11 = 66$

h) $\square \times 9 = 54$

i) $\square \times 6 = 18$



7.10 Areas of Composite Figures

Rectangle:
 $A = l \times w$

Parallelogram:
 $A = b \times h$

Circle:
 $A = \pi \times r^2$

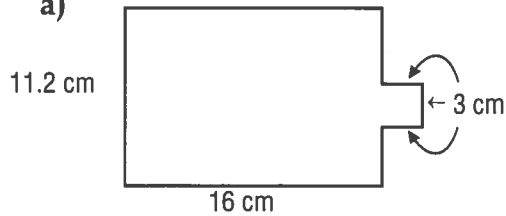
Square:
 $A = s^2$

Triangle:
 $A = \frac{1}{2} \times b \times h$

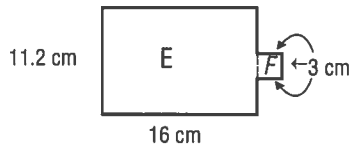
Practice

1. Calculate the area of each figure.

a)



First: Break the shape into more than one shape.



Second: Find the dimensions of each shape.



Third: Find the area of each shape.

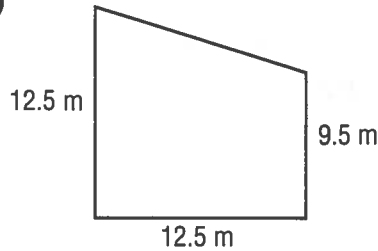
$$\begin{aligned} \text{Area } E &= l \times w & \text{Area } F &= l \times w \\ &= \underline{\quad} \times \underline{\quad} & &= \underline{\quad} \times \underline{\quad} \\ &= \underline{\quad} & &= \underline{\quad} \end{aligned}$$

Fourth: Add the areas of all the shapes.

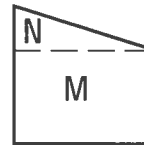
$$\begin{aligned} A &= \text{Area of shape } E + \text{Area of shape } F \\ &= \underline{\quad} + \underline{\quad} \\ &= \underline{\quad} \end{aligned}$$

Sentence: The total area of the shape is _____.

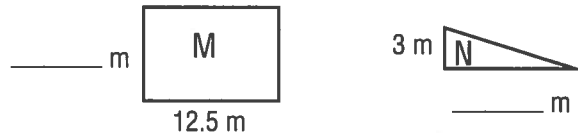
b)



First: Break the shape into more than one shape.



Second: Find the dimensions of each shape.



Third: Find the area of each shape.

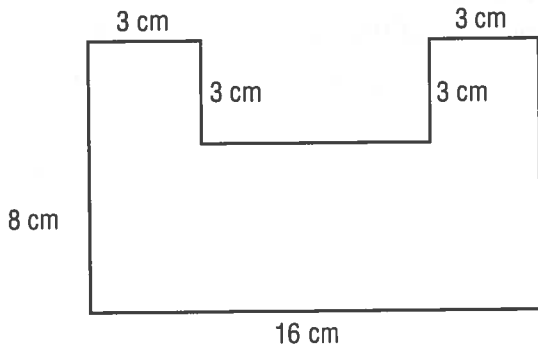
$$\begin{aligned} \text{Area } M &= l \times w & \text{Area } N &= \frac{1}{2} \times b \times h \\ &= \underline{\quad} \times \underline{\quad} & &= \frac{1}{2} \times \underline{\quad} \times \underline{\quad} \\ &= \underline{\quad} & &= \underline{\quad} \end{aligned}$$

Fourth: Add the areas of all the shapes.

$$\begin{aligned} A &= \text{Area of shape } M + \text{Area of shape } N \\ &= \underline{\quad} + \underline{\quad} \\ &= \underline{\quad} \end{aligned}$$

Sentence: The total area of the shape is _____.

c) Calculate the area of this figure.



First:

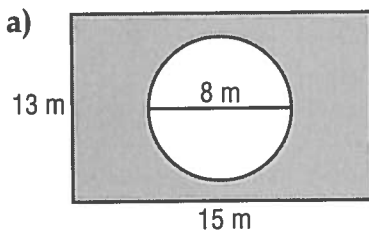
Second:

Third:

Fourth:

Sentence: _____

2. Calculate the area of each shaded region.



First:

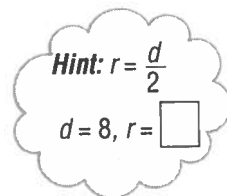
Find the area of the outside shape (*rectangle*).

$$A = l \times w$$

$$= \underline{\quad} \times \underline{\quad}$$

$$= \underline{\quad}$$

Second: Find the area of the shape **not** shaded (*circle*).



$$A = \pi \times r^2$$

$$= 3.14 \times \underline{\quad}^2$$

$$= \underline{\quad}$$

Third: Subtract: Area of outside shape – Area of inside shape

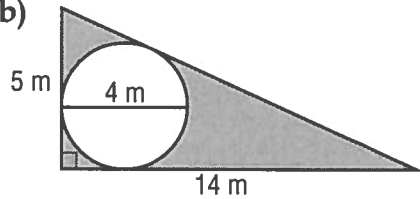
$$\text{Area of shaded region} = \underline{\quad} - \underline{\quad}$$

$$A = \underline{\quad}$$

Sentence: The area of the shaded region is _____.

Calculate the *area* of each shaded region.

b)



First:

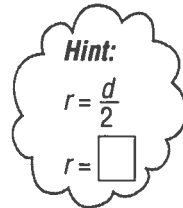
Find the area of the outside shape (*triangle*).

$$A = \frac{b \times h}{2}$$

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

$$= \square$$

Second: Find the area of the shape **not** shaded.



$$A = \pi \times r^2$$

$$= 3.14 \times \square^2$$

$$= \square$$

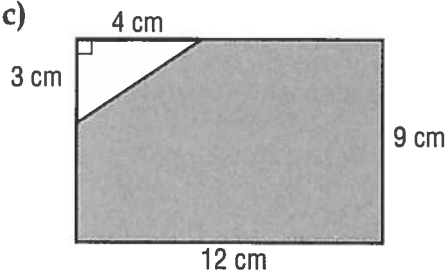
Third: Subtract: Area of outside shape – Area of inside shape

Area of shaded region = –

A = _____

Sentence: _____

c)



First:

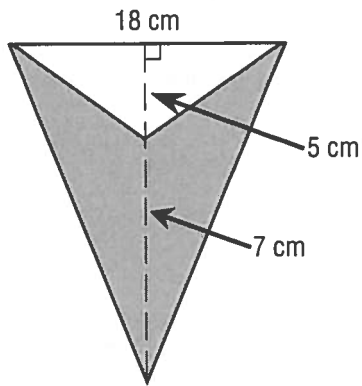
Second:

Third:

Sentence: _____

Calculate the area of each shaded region.

d)



First:

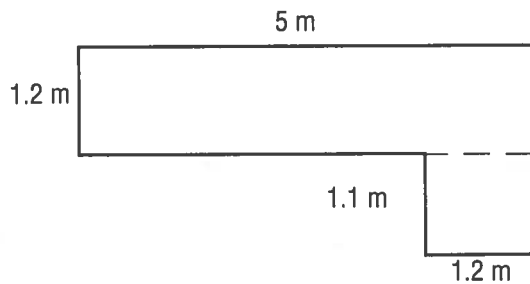
Second:

Third:

Sentence: _____

Problems and Applications

3. a) Calculate the area of the patio shown.



First:

Break the shape into 2 rectangles.

Second: Find the dimensions of each shape.

Third: Find the area of each shape.

Fourth: Add the areas.

Sentence: _____

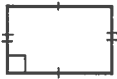
b) Paving costs $\$42/\text{m}^2$. How much does it cost to pave the patio?

Sentence: _____

Skill Builder

1. Calculate the *perimeter*.

a) rectangle with $l = 4$ cm, $w = 3$ cm



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

Formula

Substitute

Calculate

b) regular hexagon with $s = 4.8$ cm



$$P = 6 \times s$$

2. Calculate the *area*.

a) circle with $r = 1.5$ cm

$$\pi = 3.14$$

Formula

Substitute

Calculate

b) triangle with $b = 2$ cm, $h = 7$ cm

Formulas:
 $A = \pi r^2$
 $A = \frac{1}{2} \times b \times h$

3. Calculate.

When dividing by 0.1, 0.01, 0.001, ... move the decimal to the right.

a) $7.6 \div 0.001 =$ _____ b) $2 \div 0.01 =$ _____ c) $4500 \div 0.01 =$ _____

When multiplying by 0.1, 0.01, 0.001, ... move the decimal to the left.

d) $15.5 \times 0.01 =$ _____ e) $374 \times 0.001 =$ _____ f) $9.3 \times 0.1 =$ _____



NO CALCULATOR

Understand the Problem

Think of a Plan

Carry Out the Plan

Look Back

7.11 Working With Perimeter and Area

$A = \pi \times r^2$ $P = 2 \times l + 2 \times w$ $A = b \times h$ $A = l \times w$ $A = \frac{1}{2} \times b \times h$ $C = \pi \times d$



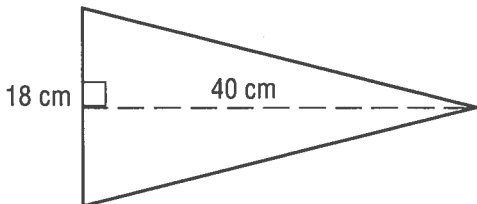
PROBLEM SOLVING

Problems and Applications

Round each answer to the nearest hundredth (2 decimal places), when necessary.

1. Josh and Brenda make pennants to sell at a fund raiser for the school basketball team. What area of cloth is needed for each pennant?

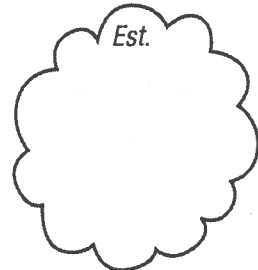
Diagram:



Formula

Substitute

Calculate



Sentence: _____

2. A compact disc has a diameter of 12 cm. Its plastic case is 14 cm by 12.5 cm.

a) What is the perimeter of the case that holds the disc?

Diagram:



Formula

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

Substitute

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

Calculate

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

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



Sentence: _____

b) What is the circumference of the compact disc?

Diagram:



Formula

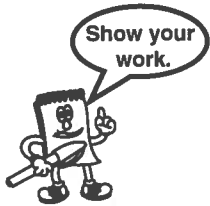
$$C =$$

Substitute

Calculate

Sentence: _____

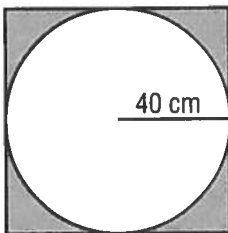
c) What is the difference between the perimeter of the case and the circumference of the compact disc?



Sentence: _____

3. The radius of a circular air conditioner is 40 cm. It sits on a square paving stone.

Diagram:



a) The circle touches all the sides of the paving stone. What is the length of each side of the square stone?

b) What is the area of the paving stone?

Formula

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

Substitute

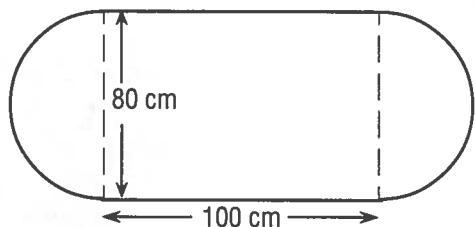
$$= \underline{\hspace{2cm}}$$

Calculate

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

Sentence: _____

4. A table has the following shape.



a) What two shapes make up the table? Draw the shapes and show the measurements of each shape.

b) Find the area of each shape.

Shape One



$$r = \frac{d}{2}, r = \square$$

Shape Two

Formula

Substitute

Calculate

c) Find the total area of the table.

$$A = \text{Shape One} + \text{Shape Two}$$

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

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

Sentence: _____

5. On grid paper, draw a diagram for the board used in the game of checkers. Use your diagram to write 2 questions involving area and perimeter.

Show all your work on grid and looseleaf paper.



1, 5, 9, 6, 7, 3

Use the above numbers only once to make

a) the largest number possible with three decimal places.

□ □ □ . □ □ □

b) the smallest number possible with three decimal places.

□ □ □ . □ □ □

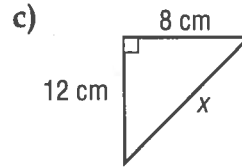
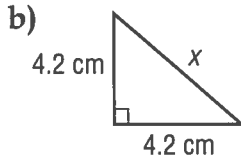
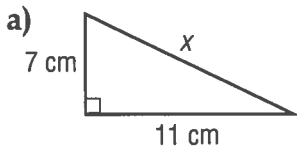
Review



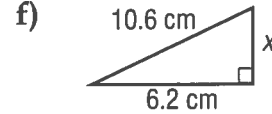
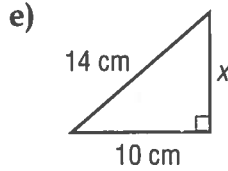
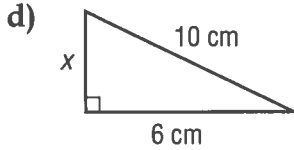
1. Calculate the missing side of each triangle, to the nearest tenth of a centimetre (1 decimal place).



Formulas: $c^2 = a^2 + b^2$ OR $a^2 = c^2 - b^2$ OR $b^2 = c^2 - a^2$



$c^2 = a^2 + b^2$ *Formula*
 $x^2 = 7^2 + \square$ *Substitute*
 $x^2 = \square + \square$ *Square*
 $x^2 = \square^2$ *Add*
 $x = \sqrt{\square}$ *Find $\sqrt{\quad}$*
 $x \doteq \square$ *Round to 1 decimal place!*

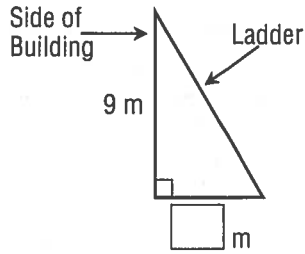


$a^2 = c^2 - b^2$ *Formula*
 $x^2 = 10^2 - \square^2$ *Substitute*
 $x^2 = \square - \square$ *Square*
 $x^2 = \square$ *Subtract*
 $x = \sqrt{\square}$ *Find $\sqrt{\quad}$*
 $x \doteq \square$ *Round to 1 decimal place!*



2. A ladder is leaning against the window frame of a building. This window is 9 m above the ground. The bottom of the ladder is 3 m away from the building. How long is the ladder?

Hint:
Complete the diagram.



Formula

Substitute

Calculate

Sentence: _____

3. Calculate each perimeter.



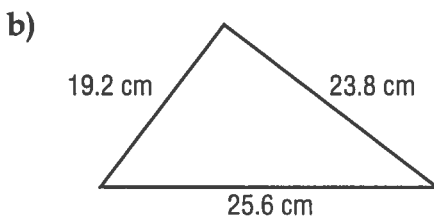
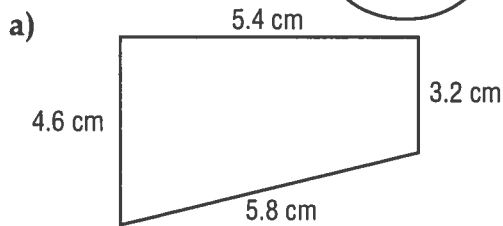
$d = 2 \times r$

Circle:
 $C = \pi \times d$

$\pi \approx 3.14$

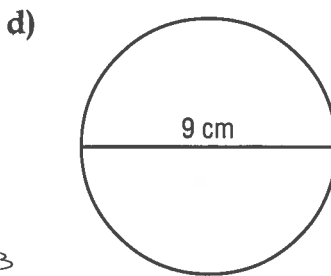
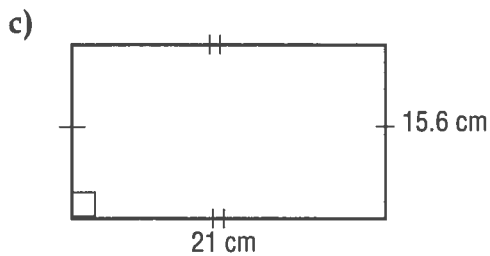
Rectangle:
 $P = 2 \times l + 2 \times w$

Perimeter = sum of all sides.



$P = \text{sum of all sides}$

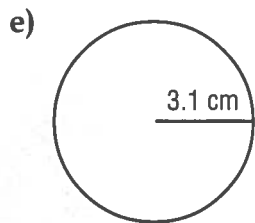
$= \text{---} + \text{---} + \text{---} + \text{---} + \text{---}$
 $= \text{---}$



Formula

Substitute

Calculate



Hint:
 $d = 2 \times r$
 $= 2 \times \square$
 $= \text{---}$

Formula

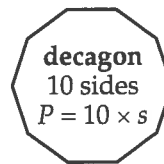
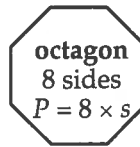
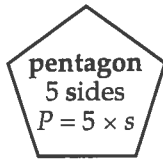
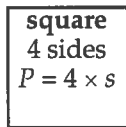
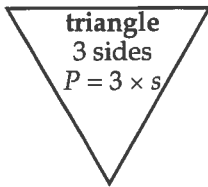
Substitute

Multiply

4. Calculate the *perimeter* of each regular polygon.

$$P = \text{number of sides} \times \text{length of a side}$$

$$P = n \times s$$



a) a pentagon with side 8.6 cm

b) a square with side 12.7 cm



$$P = 5 \times s$$

Formula

$$= 5 \times \square$$

Substitute

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

Multiply

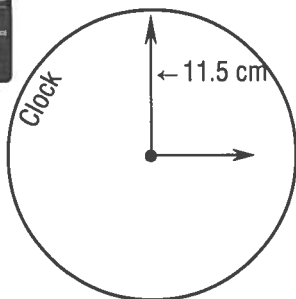
c) an octagon with side 3.15 cm

d) a triangle with side 26.9 cm

e) a hexagon with side 6.6 cm

f) a decagon with side 13.45 cm

5. The length of the minute hand on the clock is 11.5 cm. What is the circumference of the circle made by the minute hand?



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

$$d = 2 \times r$$

Formula

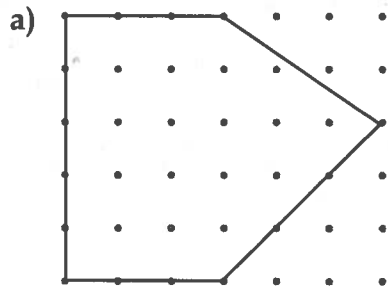
Substitute

Calculate



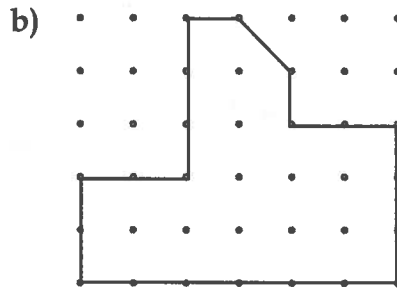
Sentence: _____

6. Find the area of each figure.



How many squares are inside each shape?

Area = _____ units²



Area = _____

7. Estimate, then calculate the area of each figure.

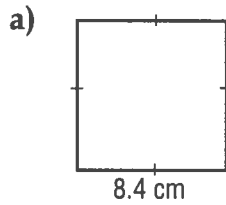
Use a formula.

$$A = l \times w$$

$$A = b \times h$$

$$A = \pi \times r^2$$

$$A = \frac{b \times h}{2}$$

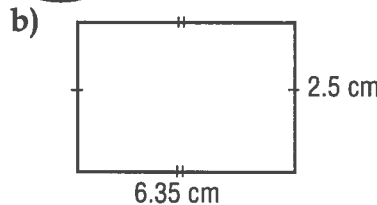


Est.
8 × 8
= _____

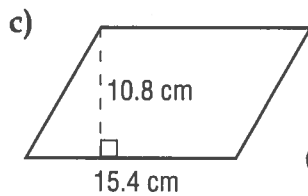
Formula

Substitute

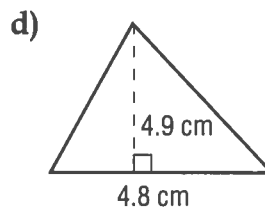
Calculate



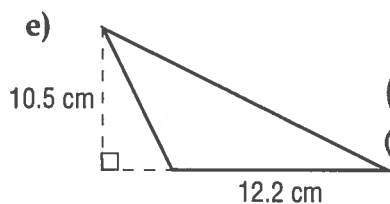
Est.



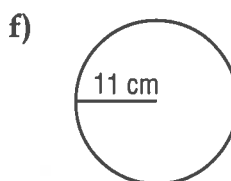
Est.



Est.



Est.

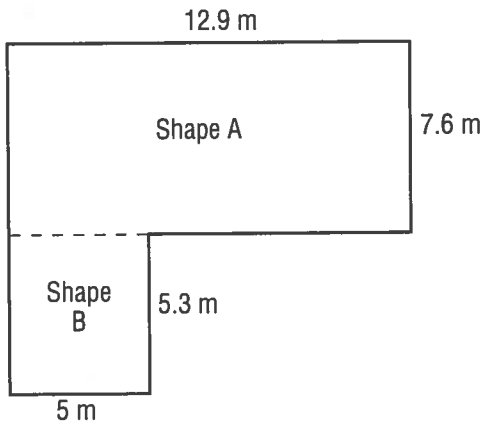


Est.

8. Calculate the area of each figure.

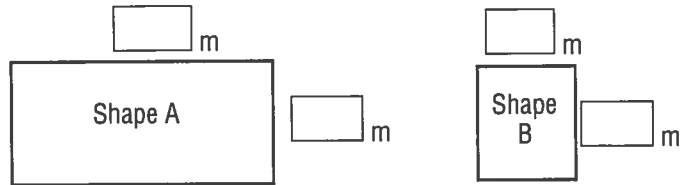


a)



First: Break the large shape into more than one shape.

Second: Draw and label each shape.



$A = l \times w$

$A = l \times w$

= _____ × _____

= _____ × _____

= _____

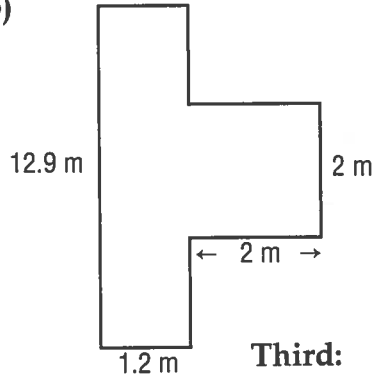
= _____

Third: Find the area of each shape.

Fourth: Add the areas of the shapes.

Sentence: _____

b)



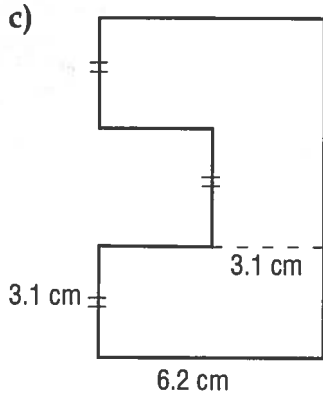
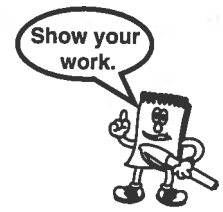
First: Break up the large shape.

Second: Draw and label each shape.

Third: Find the area of each shape.

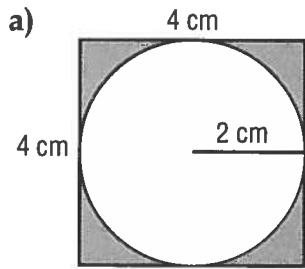
Fourth: Add the areas of all the shapes.

Sentence: _____

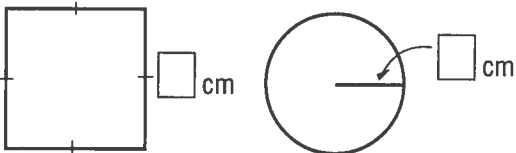


Sentence: _____

9. Calculate the *area* of each *shaded* region.

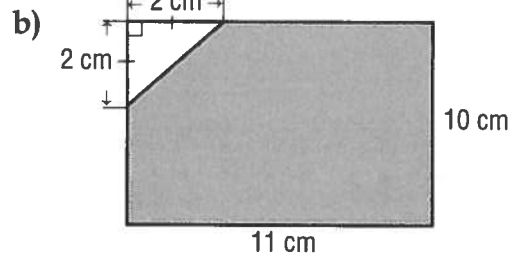


First: Label each shape.

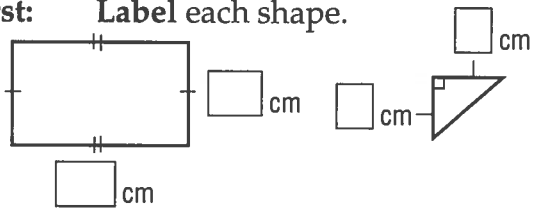


Second: Find the area of each shape.

Third: Subtract areas.



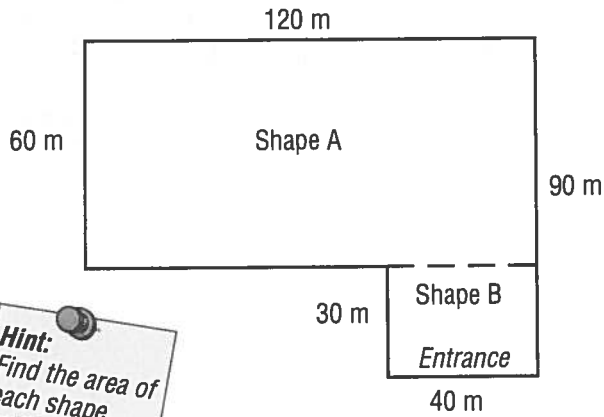
First: Label each shape.



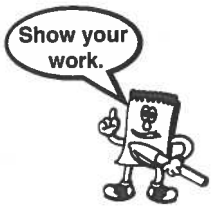
Second: Area of each shape.

Third: Subtract areas.

10. The following is the floor plan of a parking lot.



Hint:
Find the area of each shape.



a) What is the area of the parking lot?

Shape A:

Shape B:

Sentence: _____

b) How many metres of fencing are needed to surround the parking lot?
(Do not include the entrance.)

Hint:
Find the perimeter.

$P = \text{sum of all sides.}$

Sentence: _____

Math

Zapper

Remove one toothpick, so only 3 small squares remain.

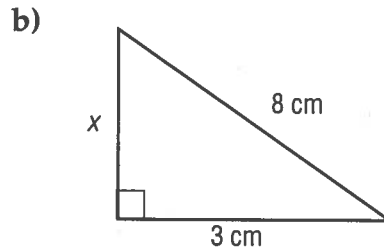
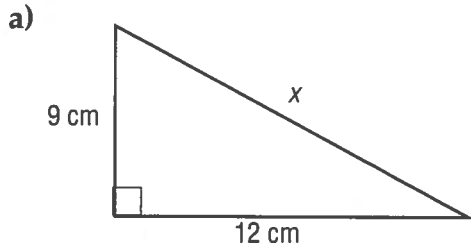
Not allowed!

Chapter Check



1. Calculate each unknown length, to the nearest tenth of a centimetre (1 decimal place).

Formulas: $c^2 = a^2 + b^2$ OR $a^2 = c^2 - b^2$ OR $b^2 = c^2 - a^2$



$c^2 = \underline{\quad} + \underline{\quad}$

Formula

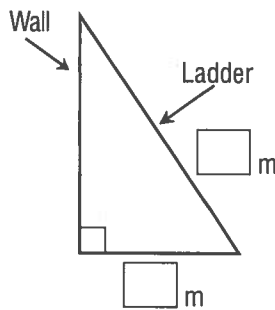
$a^2 = \underline{\quad} - \underline{\quad}$

Substitute

Calculate

2. A 10 m ladder is leaning against the side wall of a house. The bottom of the ladder is 4 m from the wall. How far up the wall is the top of the ladder, to the nearest tenth of a metre?

Complete the diagram.



$a^2 = c^2 - b^2$

Formula

Substitute

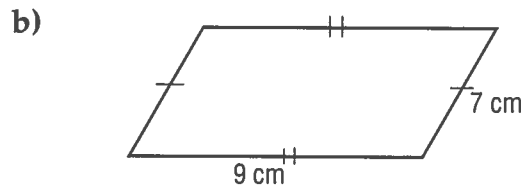
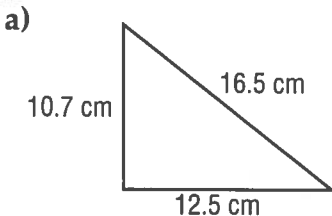
Calculate

Sentence: _____

3. Calculate the perimeter of each figure.



Formulas: $P = \text{sum of all sides}$
 $P = 2 \times l + 2 \times w$ $P = n \times s$ $C = \pi d$



$P = \text{sum of all sides}$

Formula

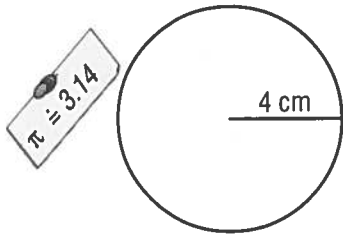
$= \underline{\quad} + \underline{\quad} + \underline{\quad}$

Substitute

$= \underline{\quad}$

Add

c) Calculate the circumference.



Hint:
 $d = 2 \times r$
 $= 2 \times \underline{\quad}$
 $= \square$

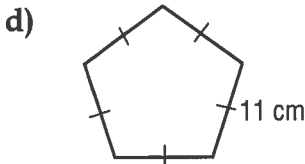
Formula

Substitute

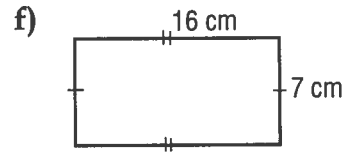
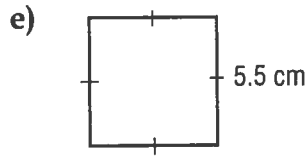
Multiply

Formulas:
 $P = \text{sum of all sides}$
 $P = 2 \times l + 2 \times w$
 $P = n \times s$
 $C = \pi \times d$

Calculate the *perimeter* of each shape.



$P = 5 \times s$
 $= \underline{\quad} \times \underline{\quad}$
 $= \underline{\quad}$

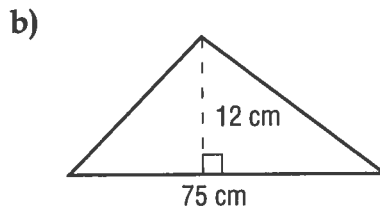
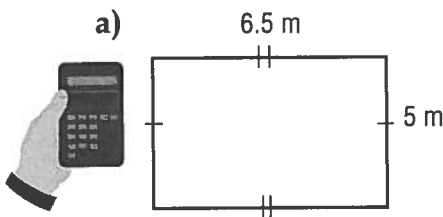


$P = (2 \times l) + (2 \times w)$

4. Calculate the *area* of each figure.

Formulas:

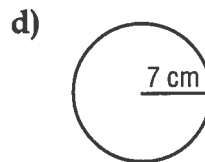
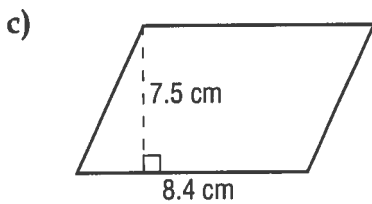
Triangle: $A = \frac{1}{2} \times b \times h$ OR $A = \frac{b \times h}{2}$	Circle: $A = \pi \times r^2$	Rectangle: $A = l \times w$	Parallelogram: $A = b \times h$
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Formula

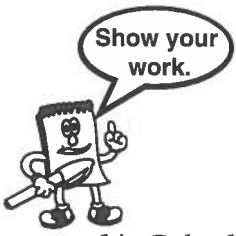
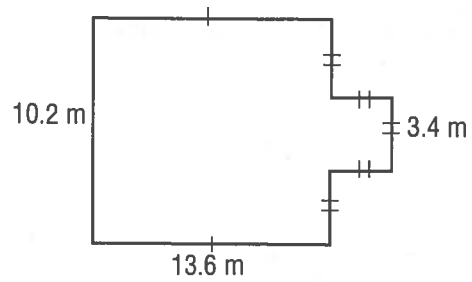
Substitute

Calculate



5. a) Calculate the **perimeter** of the shape.

$$P = \text{sum of all sides}$$



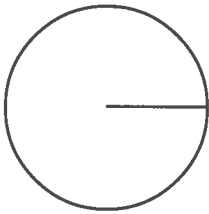
b) Calculate the **area** of the shape.

Hint:
Draw and label
each shape.

Sentence: _____

6. A face-off circle on a hockey rink has a radius of 4.5 m.

a) Calculate the **area** of the face-off circle. Round your answer to the nearest hundredth (2 decimal places).



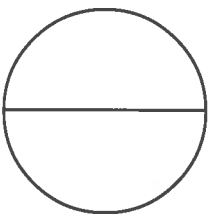
$$A = \pi \times r^2$$

Sentence: _____

b) Calculate the **circumference** of the face-off circle. Round your answer to the nearest hundredth (2 decimal places).

$$d = 2 \times r$$

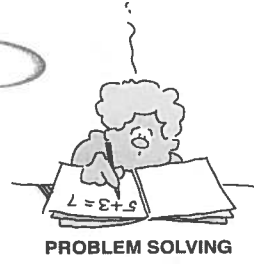
$$C = \pi \times d$$



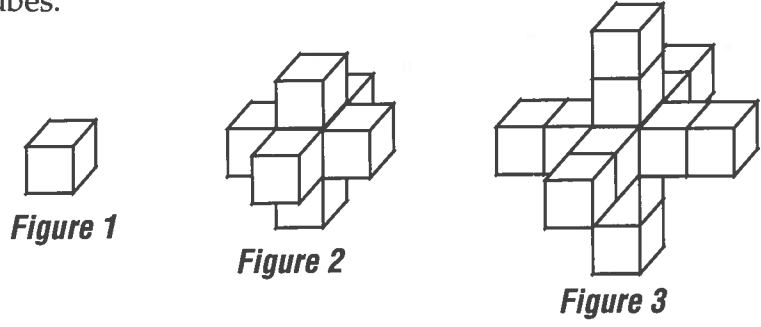
Sentence: _____

Problem Solving: Using the Strategies

Show all your work on looseleaf!



1. The first figure has 1 cube. The second figure is made up of 7 cubes. The third figure is made up of 13 cubes.

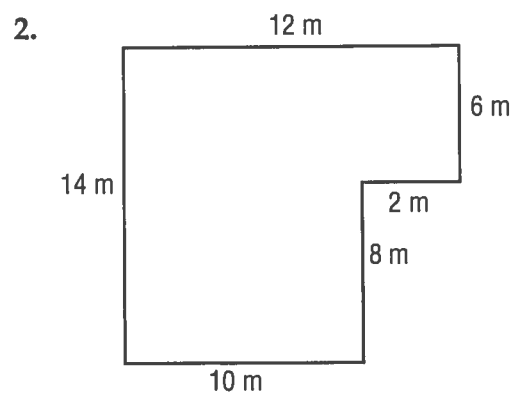


a) How many cubes are in Figure 4?

Find the pattern. Build the model with cube-a-links.

b) How many cubes are in Figure 5?

c) How many cubes are in Figure 10?



The playground is enclosed by a fence.

a) What is the total length of fence needed to go around the playground?

Perimeter = sum of all sides.

b) Fence posts are placed 2 metres apart. There is a fence post at each corner. How many posts are there?

Draw them in the diagram.

3. Three cans of dog food feed 2 dogs for one day.

a) How many cans of dog food do you need to feed 6 dogs for one day?

b) How many cans of dog food would you need to feed six dogs for one week?



4. Place the digits 4, 5, 6 in the boxes to make the multiplication correct.

$$\begin{array}{r}
 \square \square \\
 \times 3 \\
 \hline
 1 \square 2
 \end{array}$$



