Lesson 1 Perimeter PRE-ALGEBRA

The distance around a figure is called its **perimeter.**

c cm a cm

b cm
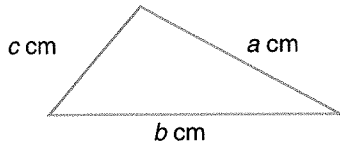
$$p = a + b + c$$

If $a = 4$, $b = 5$, and $c = 3$, the perimeter of the triangle is _____ cm.

s m
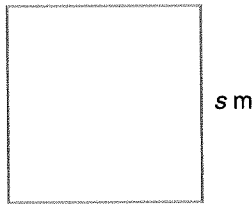
$$p = 4 \times s$$

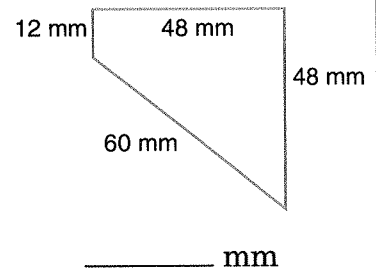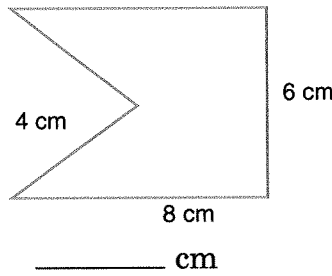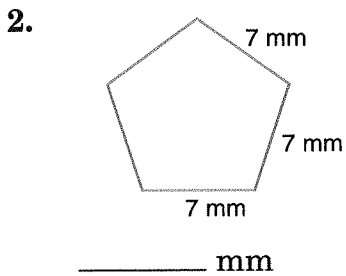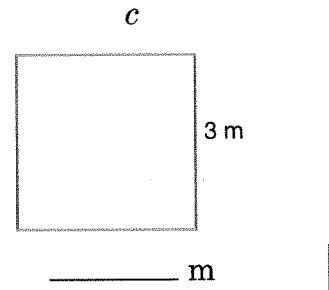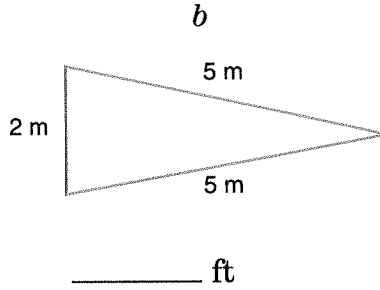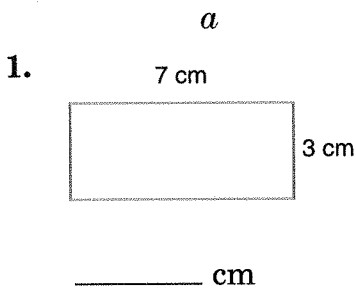If $s = 7\frac{1}{2}$, the perimeter of the square is _____ m.

l m

w m

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

If $l = 8$ and $w = 3$, the perimeter of the rectangle is _____ m.

Find the perimeter of each figure.

       a b c

1.

7 cm

3 cm

_____ cm

5 m

2 m

5 m

_____ ft

3 m

_____ m

2.

7 mm

7 mm

7 mm

_____ mm

4 cm

6 cm

8 cm

_____ cm

12 mm   48 mm

48 mm

60 mm

_____ mm

Complete the table for each rectangle described below.

	Length	Width	Perimeter
3.	9 m	4 m	_____ m
4.	4.5 km	3.5 km	_____ km
5.	7.5 cm	2.5 cm	_____ cm
6.	3.5 m	2 m	_____ m
7.	7.5 cm	6.5 cm	_____ cm

Lesson 1 Problem Solving PRE-ALGEBRA

Solve each problem.

1. The two longer sides of a lot measure 204 m and 192 m. The two shorter sides measure 92 m and 54 m. What is the perimeter of the lot?

   The perimeter is _____ m.

2. Mrs. Batka's lot is shaped like a rectangle. It is 175 m long and 48 m wide. What is the perimeter of her lot?

   The perimeter is _____ m.

3. A photograph measures 9.9 cm on each side. What is its perimeter?

   Its perimeter is _____ cm.

4. A flower bed is in the shape of a triangle. The sides measure 2.5 m, 3.5 m, and 4.5 m. What is the perimeter of the flower bed?

   The perimeter is _____ m.

5. Luke is going to put tape around a rectangular table. He has 2.5 m of tape. The table is 60 cm wide and 70 cm long. Will the tape be too long or too short? By how much?

   The tape will be too _____.

   by _____ cm.

6. Each side of a triangle is 2.3 m long. Each side of a square is 1.6 m long. Which figure has the greater perimeter? How much greater?

   The _____ has the greater perimeter.

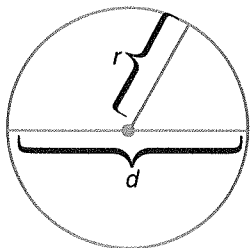   It is _____ m greater.

1.	2.
3.	4.
5.	
6.	

Lesson 2 Circumference of a Circle PRE-ALGEBRA

The perimeter of a circle is called its circumference.
The length of a *diameter* is twice the length of a *radius*.
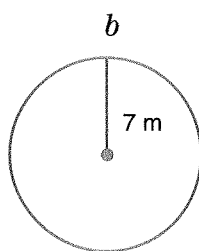$$d = 2 \times r \text{ and } r = d \div 2$$
For circles of all sizes, $C \div d$ names the same number. This number is represented by π (spelled *pi* and pronounced *pie*). π is approximately equal to 3.14.

To find the circumference of a circle, use $C = \pi \times d$ or $C = 2 \times \pi \times r$.
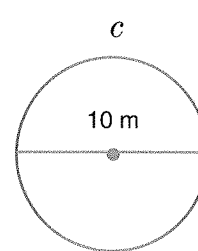
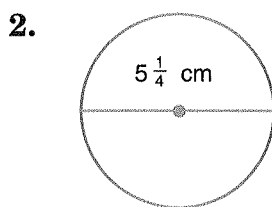Find the approximate circumference of each circle. Use 3.14 for π.

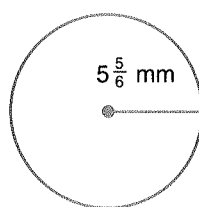| a	b	c

1.
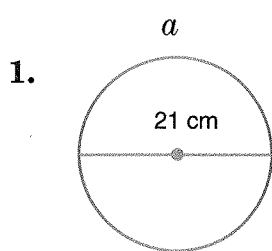
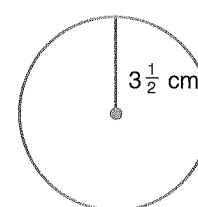about _____ cm   about _____ m   about _____ m

2.

about _____ cm   about _____ mm   about _____ cm

Complete the table for each circle described below. Use 3.14 for π.

	Diameter	Radius	Approximate circumference
3.	8 m	_____ m	_____ m
4.	_____ cm	3 cm	_____ cm
5.	7 mm	_____ mm	_____ mm
6.	_____ cm	8.5 cm	_____ cm
7.	9.4 km	_____ km	_____ km
8.	_____ m	7.2 m	_____ m

Lesson 2 Problem Solving PRE-ALGEBRA

Solve each problem. Use 3.14 for π.

1. Mr. Wilson's spare wheel has a 18-cm radius. What is the diameter of the wheel? What is the circumference of the wheel?

The diameter is _____ cm.

The circumference is about _____ cm.

2. The spare for Ms. Wolfson's car has a 71-cm diameter. What is the radius of the tire? What is the circumference of the tire?

The radius is _____ cm.

The circumference is about _____ cm.

3. A circular play area has a radius of 16.5 m. What is the circumference of the play area?

The circumference is about _____ m.

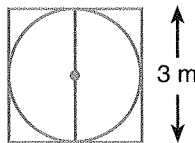**4.** The diameter of a dime is 18 mm. How long is the radius? How long is the circumference?

The radius is _____ mm.

The circumference is about _____ mm.

5. The top of a large vat has a 2.5 m diameter. What is the circumference of the top of the vat?

The circumference is about _____ m.

6. Which has the greater perimeter, the square or the circle? How much greater?

3 m

The _____ has the greater perimeter.

It is about _____ m greater.

1.	
2.	
3.	**4.**
5.	**6.**

Lesson 3 Circumference of a Circle PRE-ALGEBRA

$C = \pi \times d$ and $d = C \div \pi$	$C = 2 \times \pi \times r$ and $r = C \div (2 \times \pi)$
Find d if $C = 66$.	Find r if $C = 25.12$

Find d if $C = 66$.
$$d = C \div \pi$$
$$\doteq 66 \div 3.14$$
$$\doteq 21$$

The diameter is about _____ units.

Find r if $C = 25.12$
$$r = C \div (2 \times \pi)$$
$$\doteq 25.12 \div (2 \times 3.14)$$
$$= 25.12 \div 6.28$$
$$= 4$$

The radius is about _____ units.

Complete the table for each circle described below.
Use 3.14 for π

	Approximate diameter	Approximate radius	Circumference
1.	_____ cm	_____ cm	22 cm
2.	_____ m	_____ m	110 m
3.	_____ mm	_____ mm	88 mm
4.	_____ m	_____ m	11 m
5.	_____ cm	_____ cm	2 cm
6.	_____ m	_____ m	33 m
7.	_____ m	_____ m	6.28 m
8.	_____ mm	_____ mm	31.4 mm
9.	_____ cm	_____ cm	9.42 cm
10.	_____ km	_____ km	21.98 km
11.	_____ m	_____ m	3.14 m
12.	_____ km	_____ km	12.56 km

CHAPTER 11

Lesson 3 Problem Solving PRE-ALGEBRA

Solve each problem. Use 3.14 for π.

1. The circumference of a wheel is 110 cm. What is the
   diameter of the wheel? What is the radius?

   The diameter is about _____ cm.

   The radius is about _____ cm.

2. What is the radius of a circle if the circumference is
   7 m? What is the diameter?

   The radius is about _____ m.

   The diameter is about _____ m.

3. The circumference of a coin is 3.14 cm. What is the
   diameter of the coin? What is the radius?

   The diameter is about _____ cm.

   The radius is about _____ cm.

4. The circumference of a circular flower bed is 9.42 m.
   What is the radius of the flower bed? What is the
   diameter of the flower bed?

   The radius is about _____ m.

   The diameter is about _____ m.

5. The circumference of a circle is 1.57 cm. What is the
   diameter? What is the radius?

   The diameter is about _____ cm.

   The radius is about _____ cm.

6. The circumference of the circle is
   9.72 m less than the perimeter of the
   square. What is the diameter of the
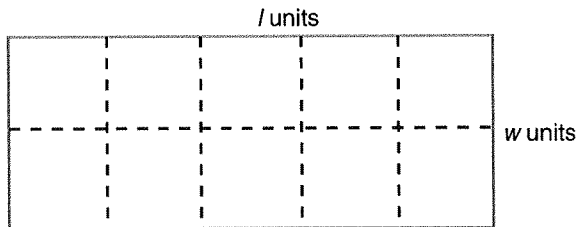   circle? What is the radius?

   The diameter is about _____ m.

   ← 4 m →

   The radius is about _____ m.

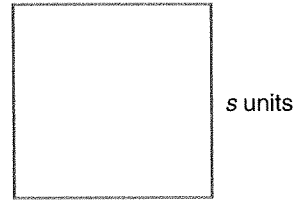1.

2.

3.

4.

5.
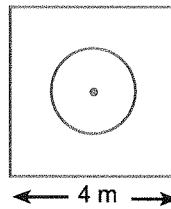
6.

Lesson 4   Area of Rectangles   PRE-ALGEBRA

To find the **area measure** (A) of a rectangle, multiply the measure of the *length* (l) by the measure of the *width* (w).

l units

w units

s units

Find A if $l = 5$ and $w = 2$.

$$A = l \times w$$
$$= 5 \times \underline{\quad 2 \quad}$$
$$= \underline{\quad 10 \quad}$$

The area is __10__ square units.

Find A if $s = 7$.

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

The area is _____ square units.

Find the area of each rectangle below.

a

1.   8 m

4 m

b

8 cm

c

9 m

17 m
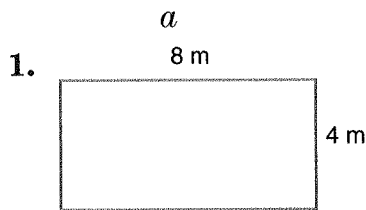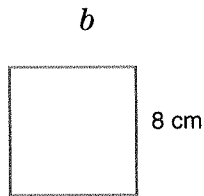
_____ m^2 _____ cm^2 _____ m^2
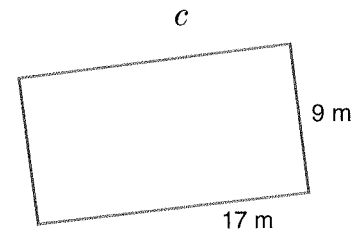
Complete the table for each rectangle described below.

	Length	Width	Area
2.	18 mm	3 mm	_____ mm^2
3.	7.5 cm	7.5 cm	_____ cm^2
4.	4.5 km	3.5 km	_____ km^2
5.	2.25 m	2.25 m	_____ m^2
6.	6.5 m	2.5 m	_____ m^2
7.	8.3 km	4.1 km	_____ km^2

Lesson 4 Problem Solving PRE-ALGEBRA

Solve each problem.

1. A rectangular sheet of paper measures 22 cm by 28 cm. What is the area of the sheet of paper?

   The area is _____ cm^2.

2. A square picture measures 14 cm along each edge. What is the area of the picture?

   The area is _____ cm^2.

3. Ms. Hudson's rectangular lot is 18 m wide and 31 m long. What is the area of her lot?

   The area is _____ m^2.

4. Mr. Hatfield asked the students to draw a rectangle that has an area of 15 cm^2. Mark drew a 3-cm by 5-cm rectangle. Nicole drew a 2.5-cm by 6-cm rectangle. Were both students correct?

   Were both students correct? _____

5. Which has the greater area, a rectangle 4 m by 6 m or a square that is 5 m long on each side? How much greater?

   The _____ has the greater area.

   It is _____ m^2 greater.

6. Trina had a rectangular-shaped board that measured 6.5 cm by 4.2 cm. A 2-cm piece was cut off the length. What is the area of the piece cut off? What is the area of the other part?

   The area of the cut-off piece is _____ cm^2.

   The area of the other part is _____cm^2.

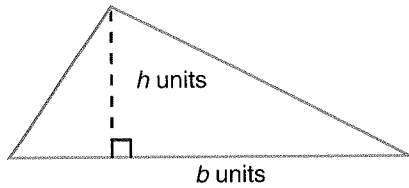| 1.	2.
3.	4.
5.	
6.	

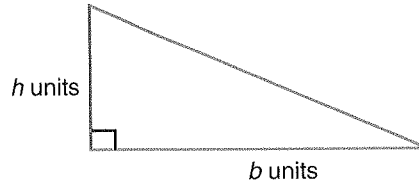# Lesson 5   Area of Triangles   PRE-ALGEBRA

To find the *area measure* (A) of a triangle, take $\frac{1}{2}$ the product of the measures of the *base* (b) and the *height* (h).

Find A if $b = 16$ and $h = 5$.

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

$\quad = \frac{1}{2} \times 16 \times 5$

$\quad = \frac{1}{2} \times \underline{\quad 80 \quad}$

$\quad = \underline{\quad 40 \quad}$

The area is __40__ square units.

Find A if $b = 12$ and $h = 7$.

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

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

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

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

The area is _____ square units.

Find the area of each triangle below.

a

1.   6 m   9 m

_____ m²

b

3 km   4 km

_____ km²

c

5 cm   12 cm

_____ cm²
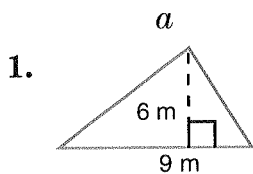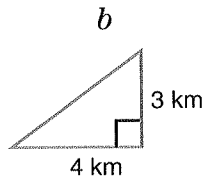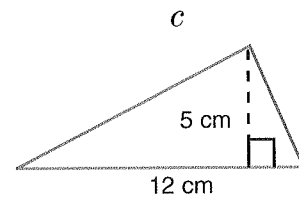
Complete the table for each triangle described below.

	Base	Height	Area
2.	12 m	6 m	_____ m²
3.	15 km	4 km	_____ km²
4.	3.5 cm	4 cm	_____ cm²
5.	7.5 cm	8.2 cm	_____ cm²
6.	4.25 mm	3.5 mm	_____ mm²
7.	12 m	14.5 m	_____ m²

Lesson 5 Problem Solving PRE-ALGEBRA

Solve each problem.

1. The base of a triangle is 6 m long. The height is 9 m. What is the area of the triangle?
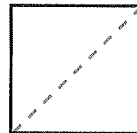
   The area is _____ m².

2. Suppose both the base and the height of a triangle are half the length of those in problem **1.** What is the area of the triangle?

   The area is _____ m².

3. A triangular playing field has a base of 14 m and a height of 18 m. What is the area of the field?
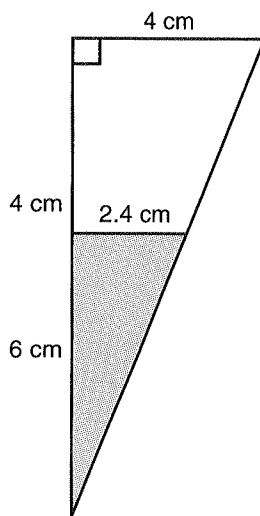
   The area is _____ m².

4. A square photograph was cut into two parts as shown. What is the area of each part?

   7 cm

   The area is _____ cm².

5. Suppose the coloured region is removed from the drawing at the right. What is the area of the part removed? What is the area of the remaining part?

   4 cm

   4 cm   2.4 cm

   6 cm

   The area of the part that is removed

   is _____ cm².

   The area of the part that remains

   is _____ cm².

6. In a triangle, the sides that form a right angle are 3.2 m long and 1.6 m long. What is the area of the triangle?

   The area is _____ m².

1.	2.
3.	4.
5.	
6.	

Lesson 6 · Area of Circles   PRE-ALGEBRA

$A = \pi \times r \times r$ is used to find the area measure of a circle.

Find A if $r = 4$.

$$A = \pi \times r \times r$$

$$\doteq 3.14 \times 4 \times \underline{\hspace{1cm}}$$
$$= 3.14 \times \underline{\hspace{1cm}}$$
$$= \underline{\hspace{1cm}}$$

The area is about _____ square units.

Find A if $d = 14$.
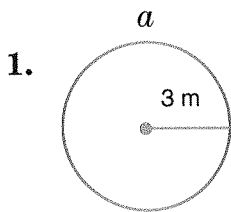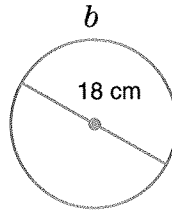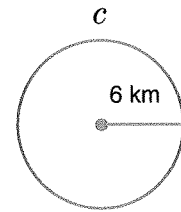(Since $d = 14$, $r = d \div 2$ or 7.)

$$A = \pi \times r \times r$$

$$\doteq 3.14 \times \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}$$
$$= 3.14 \times \underline{\hspace{1cm}}$$
$$= \underline{\hspace{1cm}}$$

The area is about _____ square units.

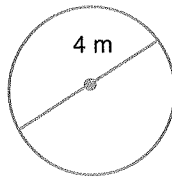Find the approximate area of each circle below. Use 3.14 for π.

a	b	c

1.

3 m

about _____ m^2

18 cm

about _____ cm^2

6 km

about _____ km^2

2.

8 mm

about _____ mm^2

4 m

about _____ m^2

5 km
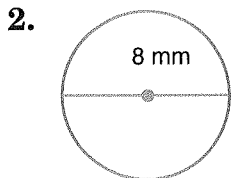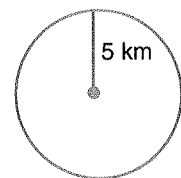
about _____ km^2

Complete the table. Use 3.14 for π.

	Diameter	Radius	Approximate area
3.	_____ mm	21 mm	_____ mm^2
4.	14 m	_____ m	_____ m^2
5.	_____ cm	16 cm	_____ cm^2
6.	70 km	_____ km	_____ km^2
7.	_____ mm	28 mm	_____ mm^2

Lesson 6 Problem Solving PRE-ALGEBRA

Solve each problem. Use 3.14 for π.

1. What is the area of a circle if the diameter of the circle is 4 cm?

   The area is about _____ cm^2.

2. What is the area of a circular flower bed if the radius is 105 cm?

   The area is about _____ cm^2.

3. What would be the area of the flower bed in problem 2 if the radius were half as long?
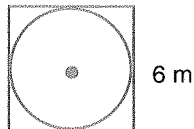
   The area would be about _____ cm^2.

4. What would be the area of the flower bed in problem 2 if the radius were twice as long?

   The area would be about _____ cm^2.

5. A quarter has a radius of 12 mm. Find the area of a quarter.

   The area is about _____ mm^2.

6. What is the area of the circle enclosed in the square? What is the area of the square?

   6 m

   The area of the circle is about _____ m^2.

   The area of the square is _____ m^2.

7. Which has the greater area, circle **A** with a diameter of 4 m or circle **B** with a radius of 3 m? How much greater?

   Circle _____ has the greater area.

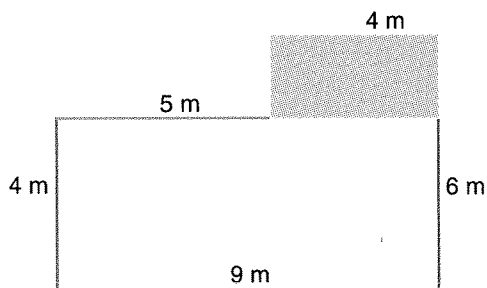   It is about _____ m^2 greater.

1.	
2.	**3.**
4.	**5.**
6.	
7.	

Lesson 7   Area of Irregular Shapes   PRE-ALGEBRA

Study how the area of this figure is found.

4 m

5 m

4 m

6 m

9 m

area of coloured part

$A = l \times w$

$= 4 \times 2$

$= $ _____

area of white part

$A = l \times w$

$= 9 \times 4$

$= $ _____

The total is _____ + _____ or _____ m^2

Find the area of each figure.

a	b

1.

5 m

5 m

8 m

3 m

_____ m^2

5 cm

3 cm

3 cm

_____ cm^2

2.

8 cm

3 cm

11 cm

_____ cm^2

6 cm

4 cm

2 cm

1 cm

_____ cm^2

3.

3 km

4 km

5 km

_____ km^2

6 mm

4 mm

8 mm

6 mm
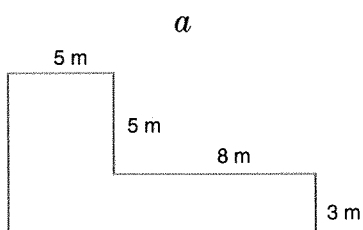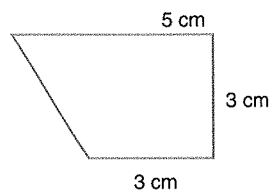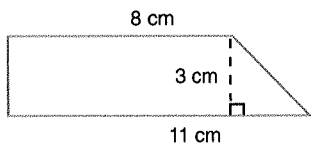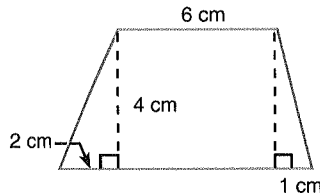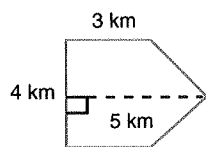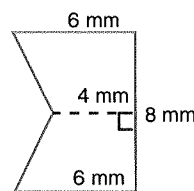
_____ mm^2

Find the area of the coloured part of each figure.

4.

4.5 cm

6 cm

_____ cm^2

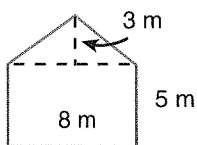3 m

9 m
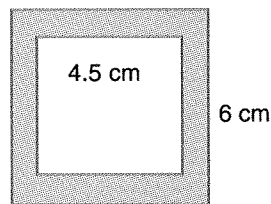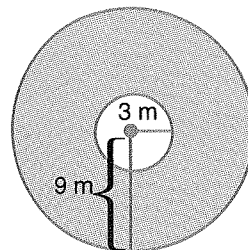
about _____ m^2

Lesson 7 Problem Solving PRE-ALGEBRA

Solve each problem.

1. Mrs. Roberts has a one-storey house that is 11 m wide and 16 m long. She plans to build an addition 4 m by 5 m. What will the total area of the house be then?

   The total area will be _____ m².

   1.

2. Ashleigh has a garden shaped as shown below. What is the area of the garden?

   The area is _____ m².

   2.

3. A rectangular piece of cloth is 8 m by 20 m. A piece with an area of 144 m² is removed. What is the area of the remaining piece?
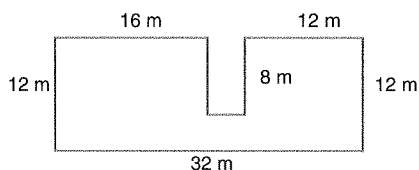
   The area is _____ m².

   3.

4. A rectangular piece of cloth is 7 m by 8 m. A square piece that is 5 m along each side is removed. What is the area of the remaining piece?

   The area is _____ m².

   4.

5. The Treadles have a lot that is 55 m by 120 m. Their house is 32 m by 38 m. Their garage is 20 m by 24 m. How much of their lot is vacant?

   _____ m² of their lot is vacant.

   5.

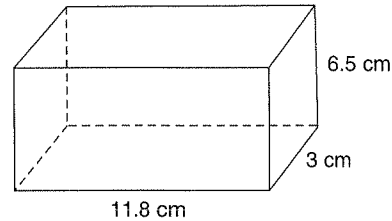6. How many square metres of carpeting would be needed to carpet the area shown below?

   _____ m² feet would be needed.

   6.

Lesson 8 Surface Area

The **surface area** (SA) of a figure is the sum of the areas of all the surfaces of the figure. Surface area is measured in square units.

The surface area of a solid is the sum of the areas of all its faces.

6.5 cm
3 cm
11.8 cm

Find the surface area of the rectangular prism shown.

area of top and bottom rectangles: $2 \times 11.8 \times 3 = 2 \times 35.4 =$ __70.8__ cm^2

area of right and left rectangles: $2 \times 6.5 \times 3 = 2 \times 19.5 =$ __39__ cm^2

area of front and back rectangles: $2 \times 11.8 \times 6.5 = 2 \times 76.7 =$ __153.4__ cm^2

$SA = 70.8 + 39 + 153.4 = 263.2$ cm^2

The surface area is __263.2__ cm^2.

Complete the table for each rectangular prism described below.

	Length	Width	Height	Surface area
1.	6 m	10 m	5 m	_____ m^2
2.	3.5 mm	7 mm	11 mm	_____ mm^2
3.	18 cm	12 cm	9 cm	_____ cm^2
4.	13 m	8 m	2 m	_____ m^2
5.	4 cm	17 cm	11 cm	_____ cm^2
6.	15 mm	6 mm	10 mm	_____ mm^2
7.	1 m	7 m	5 m	_____ m^2

Lesson 8 Surface Area

Find the surface area of each figure.

1.

6 m

5 m

9 m

_____ m²

2.

9.5 cm

9.5 cm

9.5 cm

_____ cm²

3.
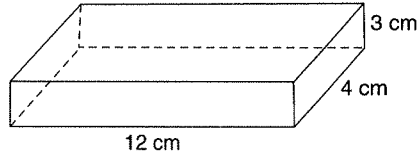
3 cm

4 cm

12 cm
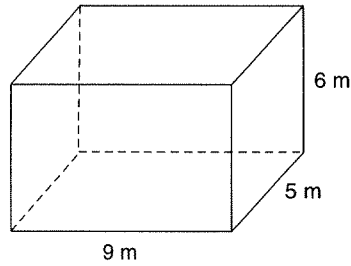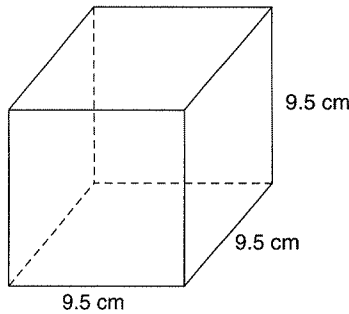
_____ cm²

Solve each problem.

4. Jessica's dad made her a wooden jewellery box in the shape of a rectangular prism. The jewellery box is 35 cm by 20 cm by 13 cm. What is the surface area of the jewellery box?

The surface area is _____ cm².

4.

5. Paul baked cookies for his aunt and put them in a rectangular tin. He decorated the tin by covering it completely with construction paper. The tin is 5 cm tall, 10 cm wide, and 15 cm long. What is the minimum amount of construction paper that Paul needed to completely cover the tin?

Paul needed at least _____ cm² of paper.

5.

CHAPTER 11 PRACTICE TEST
Perimeter and Area

Complete the table for each rectangle described below.

	Length	Width	Perimeter	Area
1.	7 m	5 m	_____ m	_____ m^2
2.	3 cm	1.5 cm	_____ cm	_____ cm^2
3.	3.5 mm	1.5 mm	_____ mm	_____ mm^2
4.	5 cm	5 cm	_____ cm	_____ cm^2

Complete the table for each triangle described below.

	Base	Height	Area
5.	7 cm	8 cm	_____ cm^2
6.	9.5 mm	4 mm	_____ mm^2
7.	7.5 m	3.4 m	_____ m^2

Complete the table for each circle described below. Use 3.14 for π.

	Diameter	Radius	Approximate circumference	Approximate area
8.	8 m	_____ m	_____ m	_____ m^2
9.	_____ mm	100 mm	_____ mm	_____ mm^2
10.	6 cm	_____ cm	_____ cm	_____ cm^2

CHAPTER 12   PRETEST
Volume

Find the volume of each rectangular prism.

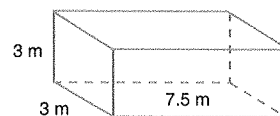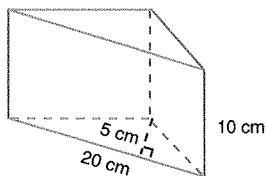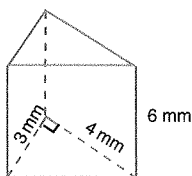| a | b | c |

1.

_____ m³

_____ cm³

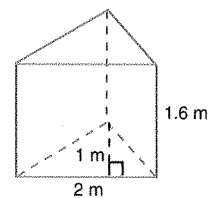_____ m³
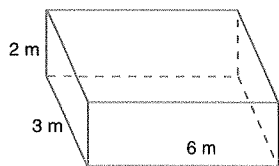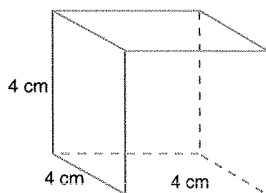
Find the volume of each triangular prism.

2.

_____ cm³

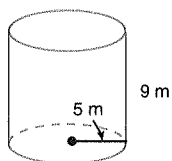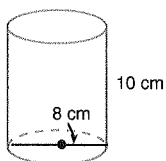
_____ mm³

_____ m³

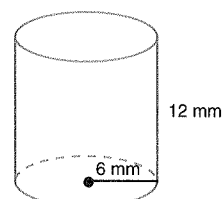Find the approximate volume of each cylinder. Use 3.14 for π.

3.

about _____ m³
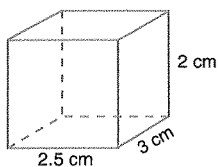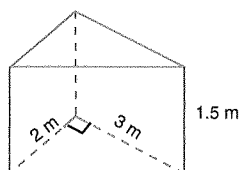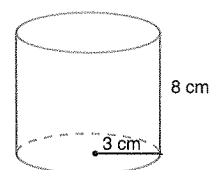

about _____ cm³

about _____ mm³

Find the volume of each.

4.

_____ cm³

_____ m³

about _____ cm³