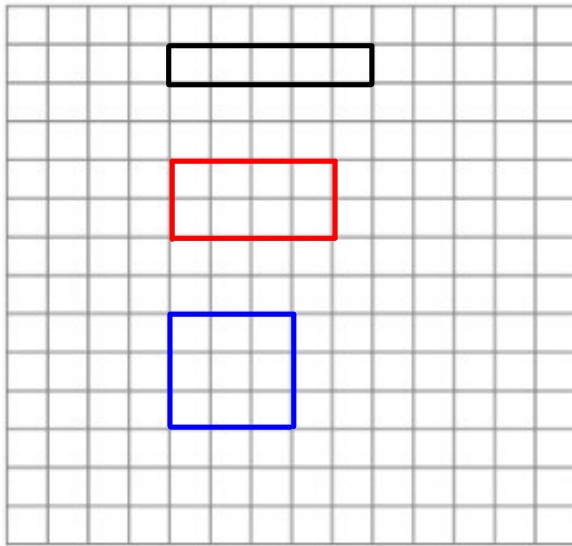


2-D Geometry

Notice/Wonder Activity: http://mrorrr-isageek.com/perimeter_jumble/

****Dont Print Page 1 and 9**

Perimeter vs. Area



What do you notice about the Perimeter of the rectangles?

What do you notice about the area of the rectangles?

What can you conclude about area and perimeter?

2-D Geometry

Unit 2 - 2-D Geometry

10.1.G.1 - Solve problems that involve SI and imperial area measurements of regular, composite, and irregular 2-D shapes, including decimal and fractional measurements.

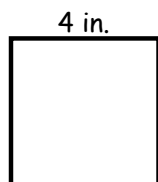
10.1.G.2 - Solve problems that require the manipulation and application of formulas related to

1. perimeter
2. area

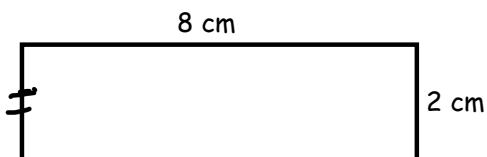
Perimeter

What is perimeter?

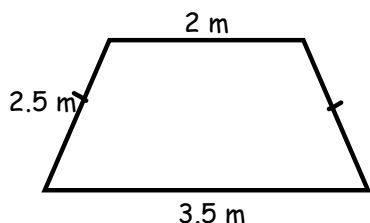
Perimeter is the total distance around the outside of a specified area. It is represented by the letter "P."



What is the perimeter of this square? Is there a formula that works for all squares?



What is the perimeter of this rectangle? Can you find a formula that works for all rectangles?



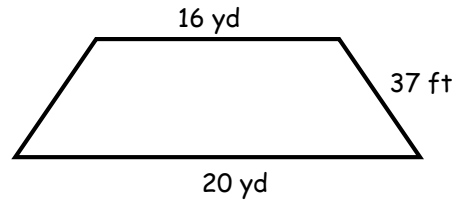
How would you find the perimeter of a shape with different sides lengths?

2-D Geometry

3.4 Solving Perimeter Problems

Ex. 1 - page 79

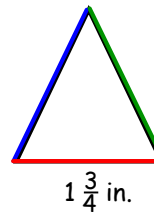
Jamilla installs underground wire for invisible fences for pets. The wire is sold by the foot. How many feet of wire will she need for the perimeter of this lot?



3.4 Solving Perimeter Problems

Ex. 2 - page 79

Jeff designs jewellery. He has $6\frac{1}{2}$ in. of gold wire for a triangular pendant. If he makes the base $1\frac{3}{4}$ in. and uses all the gold wire to go around the pendant, how long will the other two sides be?



Your Turn!

Complete # 2-5 on pages 80-81

Challenge Problem:

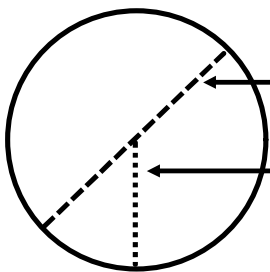
- What is the perimeter of your desk in centimetres? _____ cm
- What is the perimeter of the desks in your group in metres? _____ m
- If all the desks in the class were arranged in one long rectangle, what would the perimeter of the rectangle be in yards? _____ yds
- What would the rectangle with the largest area look like if you were to use all desks in the classroom?

Circumference

What is circumference?

Circumference is the perimeter of a circle, or the total distance around the outside of a circle. It is represented by the letter "C."

What other measurements are there in a circle?



Diameter: a straight line through the center of a circle that joins two points on the circumference

Radius: a straight line from the center of a circle to any point on the circumference

Circle Formulas:

Diameter = 2 x radius or $D = 2r$

Radius = $\frac{1}{2}$ x diameter or $R = \frac{1}{2}d$

Circumference = π x diameter or $C = \pi d$

Circumference = π x 2 x radius or $C = 2\pi r$

2-D Geometry

Discovery Activity

| Object | Diameter | Circumference |
|--------|----------|---------------|
| 1. | | |
| 2. | | |
| 3. | | |
| 4. | | |

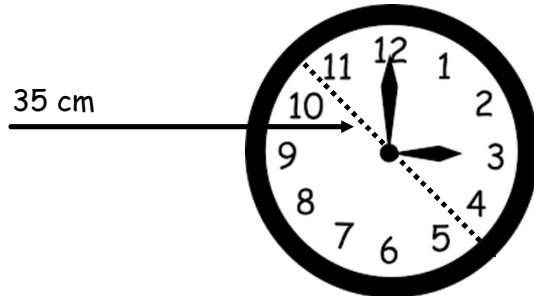
What do you notice about the diameter and the circumference?

2-D Geometry

3.5 Solving Circumference Problems

Example 1:

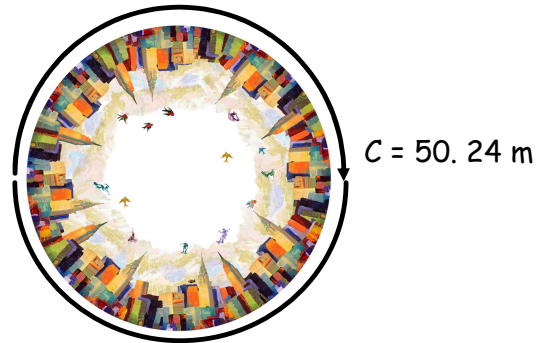
A clock has a diameter of 35 cm. What is its' circumference?



3.5 Solving Circumference Problems

Example 2:

A mural on the side of a building has a circumference of 50.24 m. What is the diameter of this mural?



Your Turn!

Complete #1, 2, 3 on pages 83-84

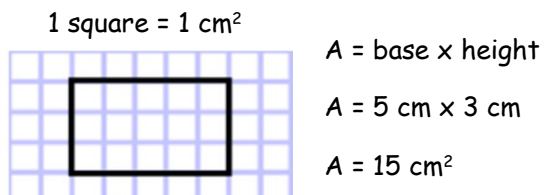
2-D Geometry

Estimating Area Using Referents

page 92-93

What is area?

Area is the number of square units that it takes to fill a flat surface.

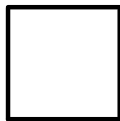


Draw the following square units:

a) square centimetre or cm²



b) square inch or in²



Example 1:

a) What objects have an area of about 1 square inch (1 in²)?

b) What objects have an area of about 1 square foot (1 ft²)?

Example 2:

a) What objects have an area of about 1 square centimeter (1 cm²)?

b) What objects have an area of about 1 square meter (1 m²)?

Your Turn!

Complete #1-2 on page 93

2-D Geometry

Estimating Area Using Grids

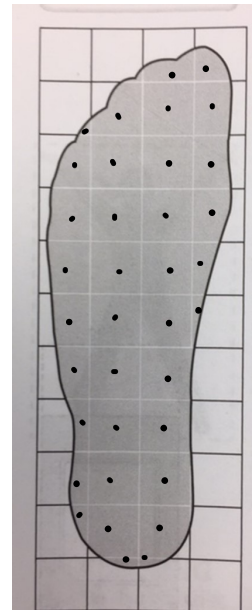
Example:

Each square on the grid represents 1 square inch (1 in^2)

a) How many whole squares are covered or almost all covered?

b) How many squares can be made using squares that are partly covered? Explain your method.

c) Estimate the total area.



*Estimating Activity

Your Turn!

Complete #1-2 on page 95

2-D Geometry

A Big High Five

Directions:

a) Estimate the area of _____ 's hand print.

*Hints:

-I love doubling and tripling

-I have a fear of water

-I love bulls

-I'm pretty good at a few sports

-I was a wizard at one point

-I now own a bunch of hornets

-I'm pretty good with a basketball (some say the greatest of all time)

b) Estimate the area of your own hand. Then, trace your own hand print over MJ's and estimate the area.

c) What is the approximate difference between the area of your hand print and Michael Jordan's?

d) What is the approximate difference of the area in square inches? (since MJ is from the United States!)

2-D Geometry

Calculating Area of 2-D Shapes

Formulas for area of 2-D Shapes:

Rectangles/Squares: $A = \text{base} \times \text{height}$

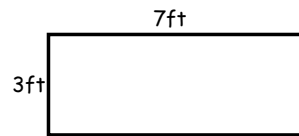
Parallelograms: $A = \text{base} \times \text{height}$

Triangles: $A = \frac{1}{2} \text{base} \times \text{height}$

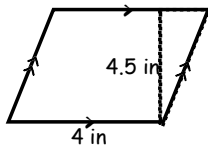
Trapezoids: $A = \frac{1}{2} (\text{sum of parallel lengths}) \times \text{height}$

Circles: $A = \pi r^2$

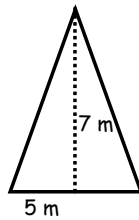
Examples:



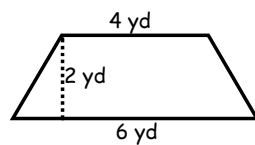
$$A = b \times h$$



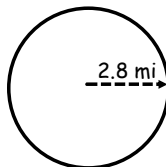
$$A = b \times h$$



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



$$A = \frac{1}{2} (\text{sum of parallel lengths}) \times \text{height}$$



$$A = \pi r^2$$

Your Turn!

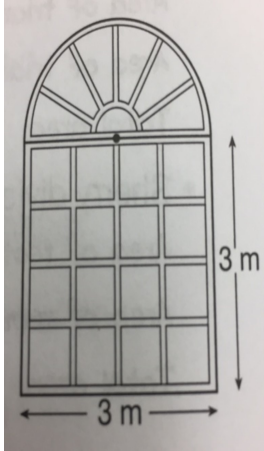
Complete #1-5 on page 98

2-D Geometry

Area of Composite Shapes

What is a composite shape?

A composite shape is a shape that can be divided into more than one basic shape (i.e. rectangles, triangles, circles, etc).



Liam is a window installer. A Norman window has this shape.
What is the area of the window?

Step 1: What basic shapes can this window be divided into?

Step 2: Find the area of each individual shape.

| | |
|-----------------------|-----------------------|
| Area of _____ = _____ | Area of _____ = _____ |
|-----------------------|-----------------------|

Step 3: Add the areas together.

$$\begin{aligned} \text{Total area} &= \text{_____ m}^2 + \text{_____ m}^2 \\ &= \text{_____ m}^2 \end{aligned}$$

Your Turn!

Complete #2 and 4 on page 114

Area in Different Systems

$$\frac{0.1550 \text{ sq in.}}{1 \text{ cm}^2}$$

$$\frac{6.4516 \text{ cm}^2}{1 \text{ sq in.}}$$

$$\frac{144 \text{ sq in}}{1 \text{ sq ft}}$$

$$\frac{10.7639 \text{ sq ft}}{1 \text{ m}^2}$$

$$\frac{0.0961 \text{ m}^2}{1 \text{ sq ft}}$$

$$\frac{0.3861 \text{ sq mi}}{1 \text{ km}^2}$$

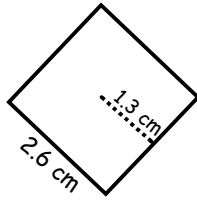
$$\frac{2.5900 \text{ km}^2}{1 \text{ sq mi}}$$

2-D Geometry

Area of Regular Polygons

What is a regular polygon?

A regular polygon is a closed figure with all equal sides and angles.



How many congruent (the same) triangles can you make in this square? _____

Let's find the area of one of them:



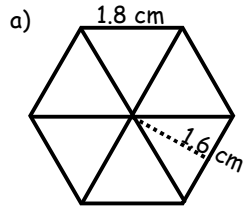
$$A = \frac{1}{2} b \times h$$

To find the total area of the square, multiply the number of congruent triangles by the area for one triangle.

So _____ x _____

= _____ cm²

Find the area of the following regular polygons:



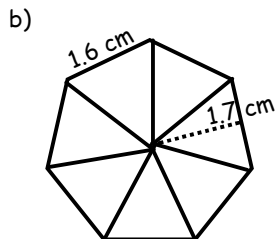
How many congruent triangles can you make? _____

Now, find the area of one triangle:

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

Total Area = _____ x _____

= _____ cm²



Your Turn!

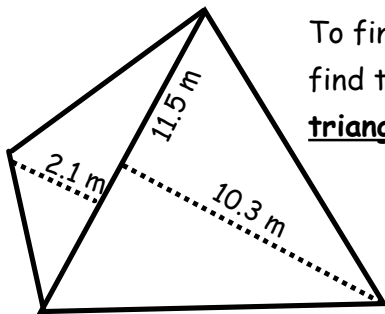
Complete #1-3 and #7 on pages 108-109

Area of Irregular Polygons

What is an irregular polygon?

An irregular polygon is a polygon that does not have all equal sides and angles.

Example: Katie designed an irregular four-sided patch of fabric to sew on her jeans.
What is the total area of the design?



To find the area of an irregular polygon, divide it into triangles and find the sum of the triangles area. **Don't forget to label the triangles!**

Area of Triangle A:

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

Area of Triangle B:

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

$$\begin{aligned} \text{Total Area} &= \text{_____} \text{m}^2 + \text{_____} \text{m}^2 \\ &= \text{_____} \text{m}^2 \end{aligned}$$

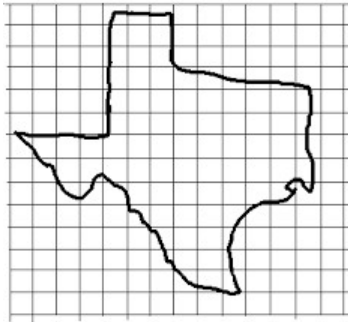
Your Turn!

Complete #1-3 on page 111

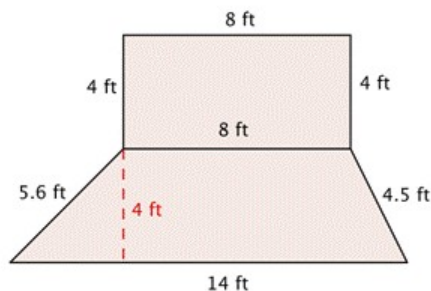
2-D Geometry

2-D Geometry Review Questions

- Jessica is building a rectangular garden box in her backyard. She has enough wood to build 30 feet of border for the garden box.
 - List, and draw, 3 different sets of dimensions that Jessica could use for her garden box.
 - Which dimensions would create the most gardening space for Jessica? Explain.
- A tree trunk has a diameter of 122 cm. What is the circumference of the tree trunk?
- The core of HBO has a circumference of 107 m. What is the distance from one of the doors to the very center of the elders court in feet?
- A regular heptagon has sides that are 12.3cm long. The distance from the middle of one side of the heptagon to the center is 7.2cm. What is the area of the heptagon.
- A regular polygon has an area of 180 ft^2 . The sides are 5 ft long and the distance from the middle of one side to the center or the polygon is 8 ft. How many sides does the polygon have?
- Estimate the area of the following state. 1 block = 1 cm^2



- If the side of one square is actually 5 km in real life, how many km does one square represent?
 - How many square kilometers is Texas?
 - How many square miles is Texas?
- Calculate the area of the following composite object. *Hint: You need to use Pythagorean Theorem to find the 3rd side of the triangle $a^2 + b^2 = c^2$



2-D Geometry

Assignment #5 - Perimeter

1. David is designing a rectangular pool with a perimeter of 110 m.

a) What is the perimeter of the pool in yards?

b) Draw three possibilities for the design of his pool.

c) Which design creates the most swimming space?

d) The pool cover costs \$4.95 per square foot. How much is the pool cover for the pool you chose in part c).

2. a) Before waves were added to the Winter Olympic medals in 2010, the medals were flat circles with a radius of 35 mm. What was the circumference of a medal, in centimetres, before 2010?

b) If the circumference of the original medal was increase by 62.83 mm, what would the new radius of the medal be?

2-D Geometry

Area in Different Systems

$$\frac{0.1550 \text{ sq in.}}{1 \text{ cm}^2}$$

$$\frac{6.4516 \text{ cm}^2}{1 \text{ sq in.}}$$

$$\frac{144 \text{ sq in}}{1 \text{ sq ft}}$$

$$\frac{10.7639 \text{ sq ft}}{1 \text{ m}^2}$$

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$$\frac{0.3861 \text{ sq mi}}{1 \text{ km}^2}$$

$$\frac{2.5900 \text{ km}^2}{1 \text{ sq mi}}$$

Assignment #5 - 2-D Geometry (Perimeter and Circumference) - Outcome 1.G.2

Outcome 1.G.1

Page 88 #4-5

Assignment #6 - 2-D Geometry

(Area of Regular, Irregular and Composite Shapes) - Outcome 1.G.1

Complete problems:

Page 104: #1, 2 (use page 5 of Geometry booklet)

Page 104: #4, 5 (use ratios given for converting square units)

Page 108: #4 (use page 8 of Geometry booklet)

Page 121: #6 (use page 9 of Geometry booklet)

Page 114: #3 (use page 10 of Geometry booklet)

2-D Geometry

Picking and Packing Strawberries

On Rhonda's family farm, the workers picked $\frac{5}{12}$ of the strawberries in the first week. These strawberries were put in 10 crates, and 20 kg were leftover. The crates were sent off to the supermarket, and the other 20 kg were sold at the family's fruit stand. During the second week, the crew picked the remaining strawberries and placed them in 15 crates. How many kilograms of strawberries did the family's crew pick during those two weeks?