

**STUDY LINK**  
**10•9**

# Area and Circumference



Circle the best measurement for each situation described below.

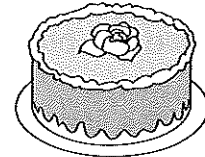
1. What size hat to buy (*Hint: The hat has to fit around a head.*)

area                  circumference                  perimeter



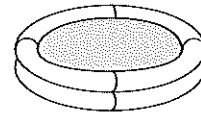
2. How much frosting covers the top of a round birthday cake

area                  circumference                  perimeter



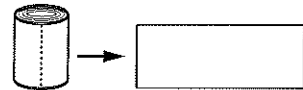
3. The amount of yard that will be covered by a circular inflatable swimming pool

area                  circumference                  perimeter



4. The length of a can label when you pull it off the can

area                  circumference                  perimeter



Fill in the oval next to the measurement that best completes each statement.

Area of a circle:  $A = \pi * r^2$   
 Circumference of a circle:  $C = \pi * d$

5. The radius of a circle is about 4 cm. The area of the circle is about

12 cm<sup>2</sup>                   39 cm<sup>2</sup>                   50 cm<sup>2</sup>                   25 cm<sup>2</sup>

6. The area of a circle is about 28 square inches. The diameter of the circle is about

3 in.                   6 in.                   9 in.                   18 in.

7. The circumference of a circle is about 31.4 meters. The radius of the circle is about

3 m                   5 m                   10 m                   15 m

8. Explain how you found your answer for Problem 7.

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**LESSON**  
**10•9**
**More Area and Circumference Problems**

**Circle Formulas**

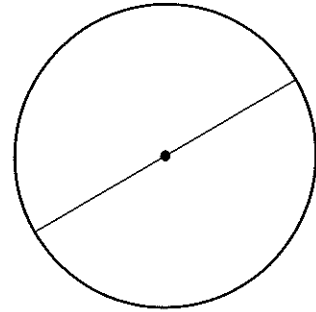
Circumference:  $C = \pi * d$

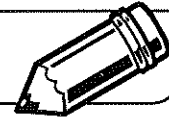
Area:  $A = \pi * r^2$

where  $C$  is the circumference of a circle,  $A$  is its area,  $d$  is its diameter, and  $r$  is its radius.

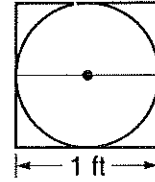
Measure the diameter of the circle at the right to the nearest centimeter.

1. The diameter of the circle is \_\_\_\_\_.
2. The radius of the circle is \_\_\_\_\_.
3. The circumference of the circle is \_\_\_\_\_.
4. The area of the circle is \_\_\_\_\_.
5. Explain the meaning of the word *circumference*. \_\_\_\_\_  
\_\_\_\_\_
6.
  - a. Use your Geometry Template to draw a circle that has a diameter of 2 centimeters.
  - b. Find the circumference of your circle. \_\_\_\_\_
  - c. Find the area of your circle. \_\_\_\_\_
7.
  - a. Use your Geometry Template to draw a circle that has a radius of  $1\frac{1}{2}$  inches.
  - b. Find the circumference of your circle. \_\_\_\_\_
  - c. Find the area of your circle. \_\_\_\_\_



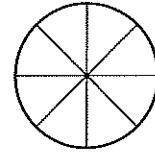
**LESSON**  
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**Modeling  $\pi r^2$** 


The figure of a circle drawn inside a square is a model that shows how the circumference of the circle is greater than 2 lengths around, but less than 4 lengths. This makes the circumference about 3 times the circle's diameter.

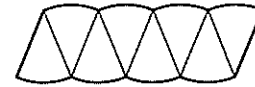


Follow the directions below to make a model that shows how the area of a circle can be found using the formula  $A = \pi r^2$ .

1. Cut along the lines of the circle to cut it into 8 pieces.



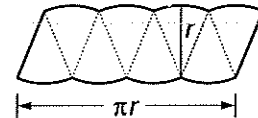
2. Arrange and glue the pieces on a sheet of construction paper so they approximate a parallelogram.



3. Use a colored pencil or marker to draw the outline of a parallelogram along the edges of your arranged circle pieces, and mark the measure of the height and the base.

The height of this figure is the same as the radius of the circle.

The base is  $\frac{1}{2}$  the circumference of the circle. The circumference is approximately  $\pi$  times the diameter. Since the radius is  $\frac{1}{2}$  of the diameter, the measure of  $\frac{1}{2}$  the diameter can be written as  $\pi$  times the radius, or  $\pi r$ .



The formula for the area of a parallelogram is  $A = b * h$ . In our model, the formula can be written as  $A = \pi r * r$ ,  $A = \pi * (r * r)$ , or  $A = \pi r^2$ .

4. Label your figure:  $A = \pi * (r * r) = \pi r^2$ .
5. Describe what you think is the most interesting thing about this model.

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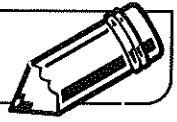
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**LESSON**  
**10•9****A Model for  $\pi r^2$** 

Cut along the dotted lines. Use the pieces for your model of the formula for the area of a circle.

