Name _____ Date _____

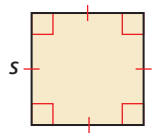
Perimeter and Area of Figures

Perimeter and Area of Polygons

The **perimeter** P of a figure is the distance around the figure. The **area** A of a figure is the number of square units enclosed by the figure.

Perimeter and Area

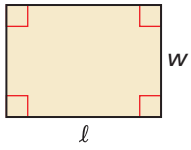
Square



$P = 4s$

$A = s^2$

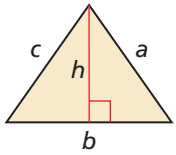
Rectangle



$P = 2\ell + 2w$

$A = \ell w$

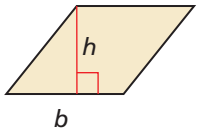
Triangle



$P = a + b + c$

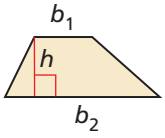
$A = \frac{1}{2}bh$

Parallelogram



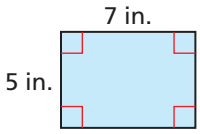
$A = bh$

Trapezoid



$A = \frac{1}{2}h(b_1 + b_2)$

Example 1 **Find the perimeter and area of the figure.**



$P = 2\ell + 2w$
$= 2(7) + 2(5)$
$= 24$ in.

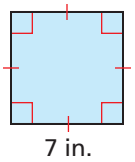
$A = \ell w$
$= 7(5)$
$= 35$ in.^{2}

Practice

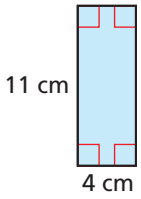
Check your answers at BigIdeasMath.com.

Find the perimeter and area of the figure.

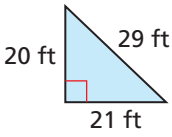
1.



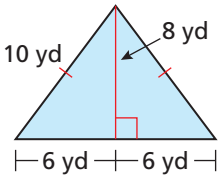
2.



3.

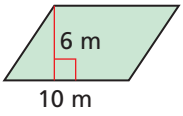


4.

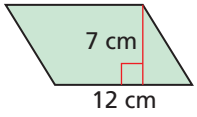


Find the area of the figure.

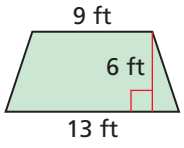
5.



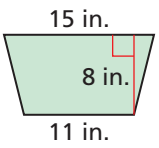
6.



7.



8.



Use a geometric formula to solve the problem.

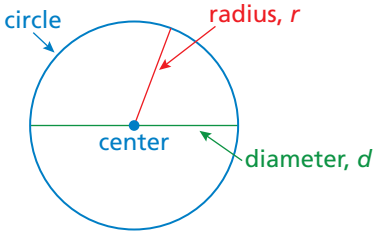
9. A triangle has a base of 7 feet and an area of 63 square feet. Find the height.

10. A rectangle has a length of 6 inches and a perimeter of 28 inches. Find the width.

Name _____ Date _____

Circumference and Area of a Circle

A **circle** is the set of all points in a plane that are the same distance from a point called the **center**. The distance from the center to any point on the circle is the **radius**. The distance across the circle through the center is the **diameter**. The diameter is twice the radius.



The **circumference** of a circle is the distance around the circle. The ratio $\frac{\text{circumference}}{\text{diameter}}$ is the same for every circle and is represented by the Greek letter π, called **pi**. Pi is an irrational number whose value is approximately 3.14 or $\frac{22}{7}$.

Circumference of a Circle	Area of a Circle
The circumference C of a circle is equal to π times the diameter d or π times twice the radius r. $C = \pi d$ or $C = 2\pi r$	The area A of a circle is the product of π and the square of the radius. $A = \pi r^2$

Example 1 **The diameter of a circle is 8.5 meters. Find the radius.**

$r = \frac{d}{2}$ Radius of a circle

$= \frac{8.5}{2}$ Substitute 8.5 for d.

$= 4.25$ Divide.

▶ The radius is 4.25 meters.

Example 2 **The radius of a circle is $5\frac{3}{4}$ feet. Find the diameter.**

$d = 2r$ Diameter of a circle

$= 2\left(5\frac{3}{4}\right)$ Substitute $5\frac{3}{4}$ for r.

$= 11\frac{1}{2}$

▶ The diameter is $11\frac{1}{2}$ feet.

Example 3 **Find (a) the circumference C and (b) the area A of the circle.**

a. $C = \pi d$

$= \pi(12)$

≈ 37.7

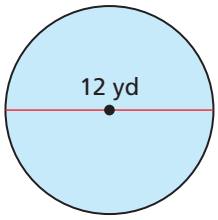
▶ The circumference is about 37.7 yards.

b. $A = \pi r^2$

$= \pi \cdot (6)^2$

$= 36\pi$

≈ 113.1



▶ The area is about 113.1 square yards.

Practice

Check your answers at BigIdeasMath.com.

11. The radius of a circle is 4.6 millimeters. Find the diameter.

12. The diameter of a circle is $2\frac{1}{4}$ miles. Find the radius.

Find the circumference and area of the circle with the given radius or diameter.

13. $r = 16$ inches **14.** $d = 10$ centimeters **15.** $r = 7$ meters **16.** $d = 2.4$ yards

17. The area of a circle is 81π square feet. Find the radius.