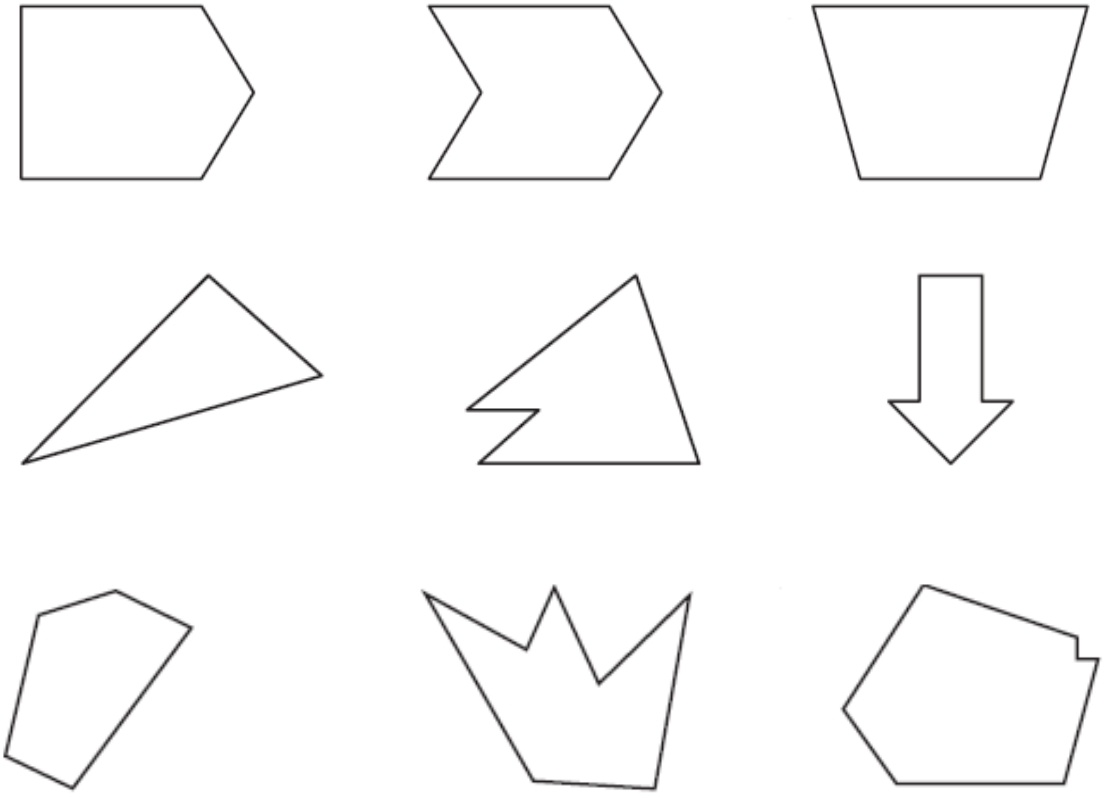
Chapter 8 Notes – Polygons and Area **Name_____**
Basic Geometry

8.1 Classifying Polygons

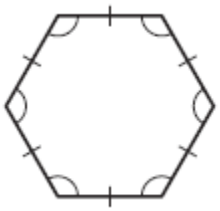
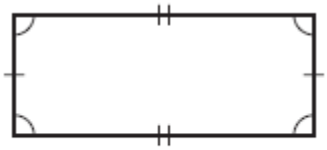
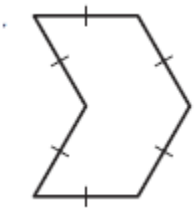
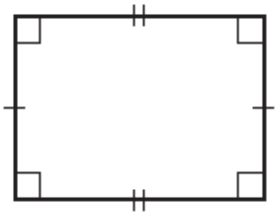
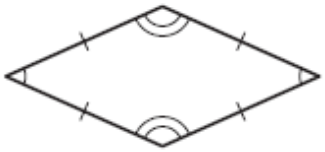
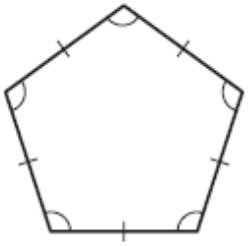
Goal: Describe polygons.

Convex Polygon: a polygon in which no line that contains a side of a polygon passes through the interior of the polygon	
Concave Polygon: a polygon that is not convex. These _____ on themselves.	
Equilateral: a polygon where all _____ are congruent	
Equiangular: a polygon where all _____ are congruent	
Regular: a polygon that is both _____ and _____	

Decide whether the polygon is convex or concave.



Decide whether the polygon is equilateral, equiangular, or regular.

Draw the polygon described.

a) Equilateral but not equiangular

b) Convex and regular

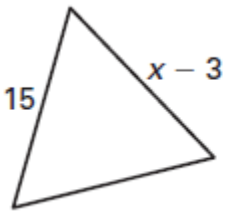
c) Convex but not regular

d) A concave hexagon

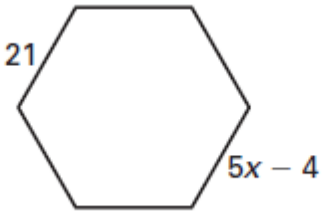
e) A convex hexagon

The polygons are regular. Find the value of x.

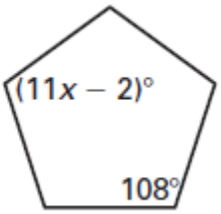
a) x = _____



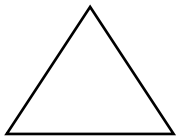
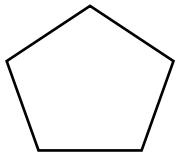
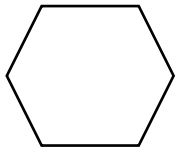
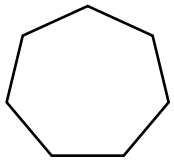
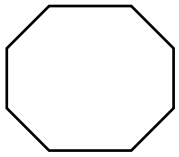
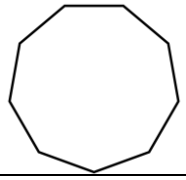
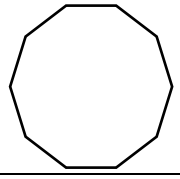
b) x = _____



c) x = _____



8.2 – Discovering the Polygon Interior Angles Theorem

Name	Picture with Diagonals	Number of Sides	Number of Triangles Formed	Sum of Interior Angles
Triangle				
Quadrilateral				
Pentagon				
Hexagon				
Heptagon				
Octagon				
Nonagon				
Decagon				
n-gon				

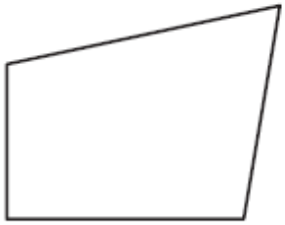
8.2 Angles in Polygons

Goal: Find the measures of interior and exterior angles of polygons

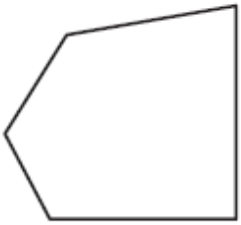
Polygon Interior Angles Theorem: The sum of the measures of interior angles of a convex polygon with *n* sides is _____

Find the sum of the measures of the interior angles of the polygons below.

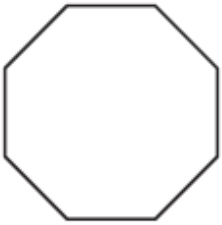
a) _____



b) _____



c) _____



d) _____

Decagon

e) _____

Heptagon

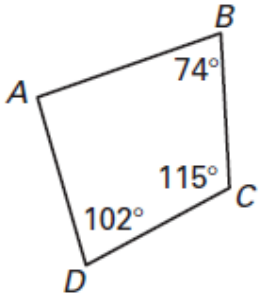
f) _____

14-gon

Find the sum of the measures of the interior angles, then find $m\angle A$.

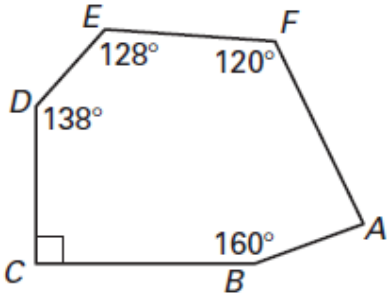
a) Sum: _____

$m\angle A =$ _____



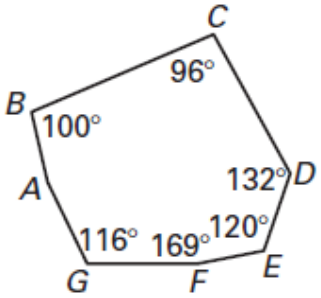
b) Sum: _____

$m\angle A =$ _____

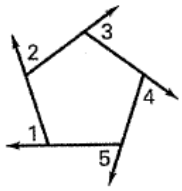


c) Sum: _____

$m\angle A =$ _____

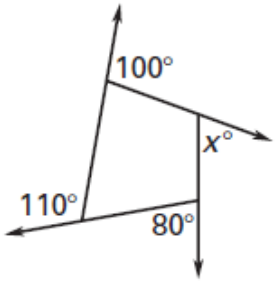


Polygon Exterior Angle Sum Theorem: the sum of the measures of the exterior angles of a convex polygon is _____

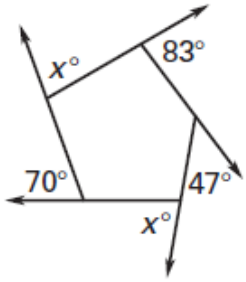


Find the value of x.

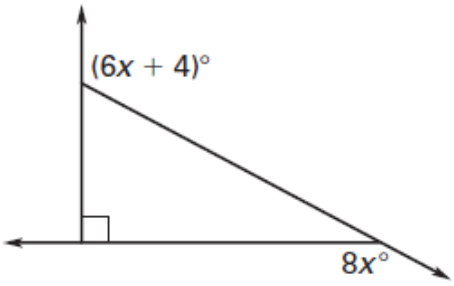
a) x = _____



b) x = _____



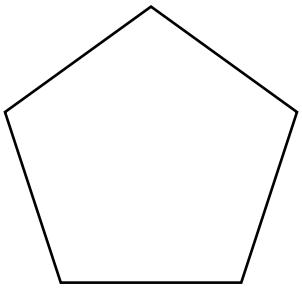
c) x = _____



Find the measure of an interior angle of the regular polygon.

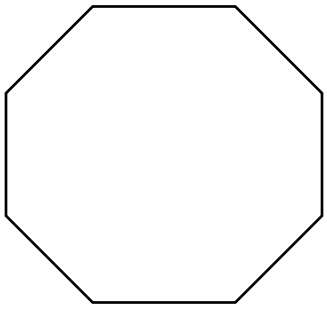
a) Sum: _____

$one \angle =$ _____



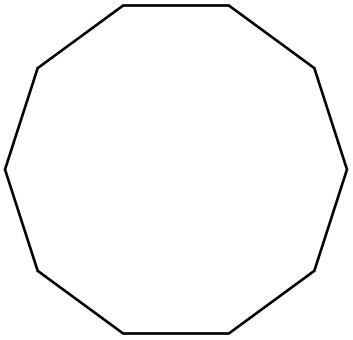
b) Sum: _____

$one \angle =$ _____



c) Sum: _____

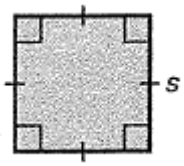
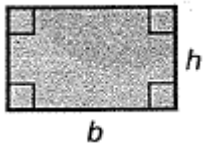
$one \angle =$ _____



8.3 Areas of Rectangles and Squares

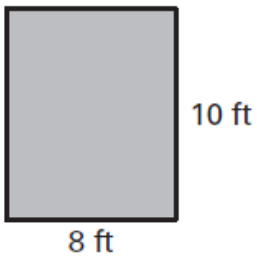
Goal: Find the area of rectangles and squares.

Area: the amount of _____ covered by a figure

Area of a Square	Area of a Rectangle
 A = _____	 A = _____

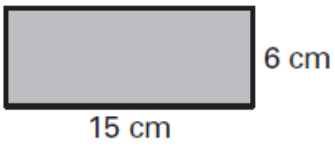
Find the area. Label your answer.

a) A = _____



b) A = _____

c) A = _____



Sketch the figure and the find its area. Label your answer.

a) A square with side lengths of 4.25 ft.

Picture:

A = _____

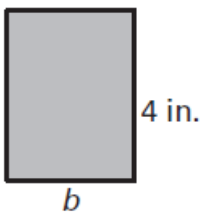
b) A rectangle with a base of 1.4 in and a height of 2.5 in.

Picture:

A = _____

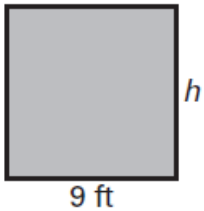
***A* gives the area of the rectangle. Find the missing side length. Label your answer.**

a) b = _____



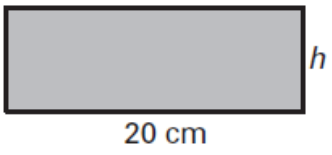
$A = 12 \text{ in.}^2$

b) h = _____



$A = 81 \text{ ft}^2$

c) h = _____



$A = 140 \text{ cm}^2$

Find the dimensions of each rectangle.

Rectangle A

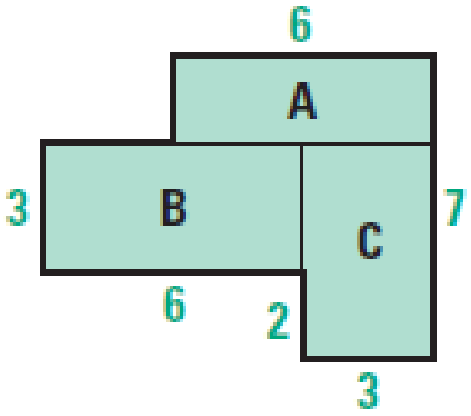
b = _____ h = _____

Rectangle B

b = _____ h = _____

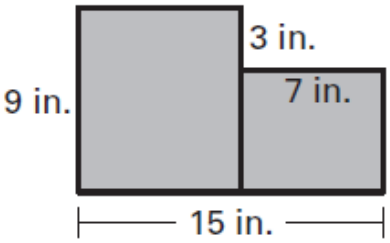
Rectangle C

b = _____ h = _____

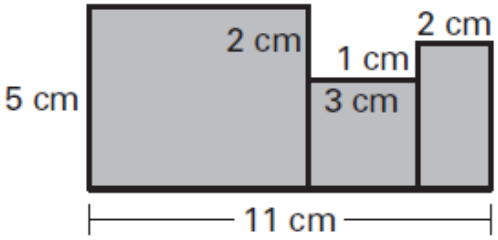


Find the area of the polygon made up of rectangles.

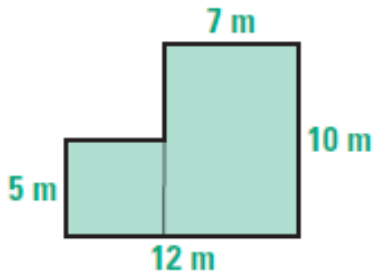
a) A = _____



b) A = _____

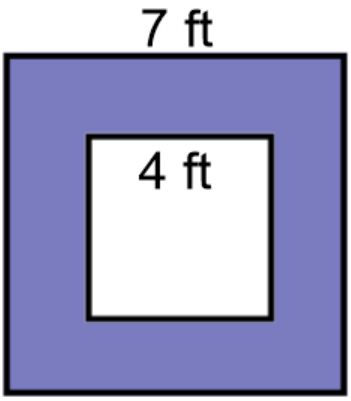


c) A = _____



Each figure to the right is a square. Find just the shaded area.

A = _____



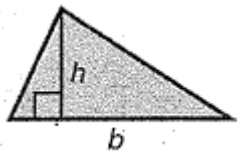
8.4 Area of Triangles

Goal: Find the area of triangles.

Height of a triangle: the _____ segment from a vertex to the line containing the opposite side called the _____

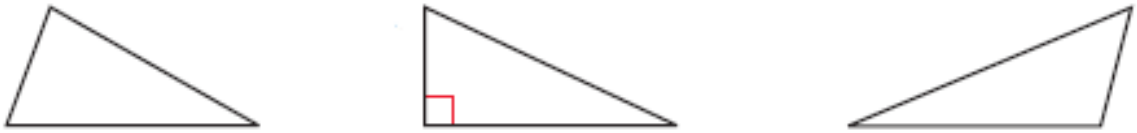
*The height and the base must make a _____ angle.

Area of a Triangle



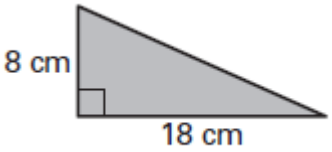
A = _____

A triangle has a base of 11 and a height of 6. Label each triangle accordingly.

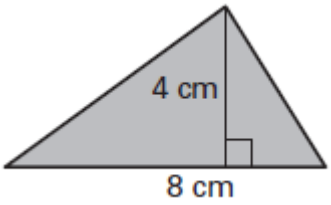


Find the area of the triangle. Label your answer

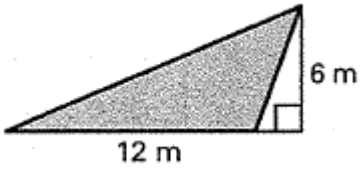
a) A = _____



b) A = _____



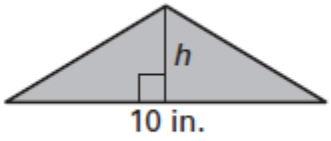
c) A = _____



***A* gives the area of the rectangle. Find the missing side length. Label your answer.**

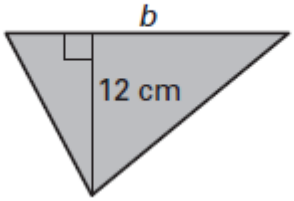
a) h = _____

$A = 15 \text{ in.}^2$



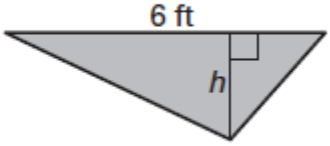
b) b = _____

$A = 126 \text{ cm}^2$



c) h = _____

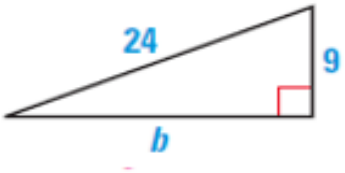
$A = 6 \text{ ft}^2$



Use the Pythagorean Theorem to find the missing side, then find the area. Label your answer.

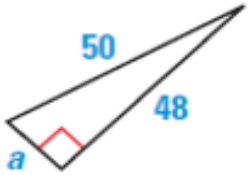
a) b = _____

A = _____



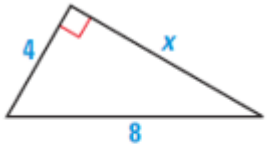
b) a = _____

A = _____



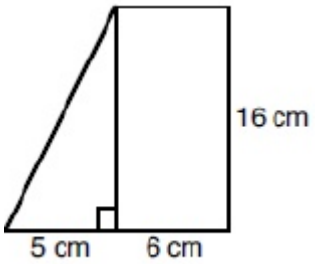
c) x = _____

A = _____

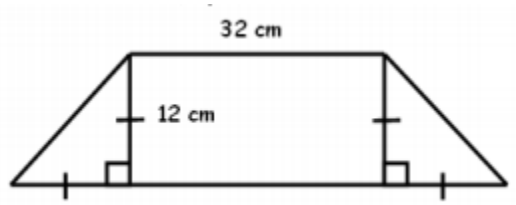


Find the area of each compound shape.

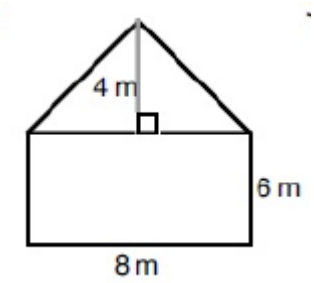
a) A = _____



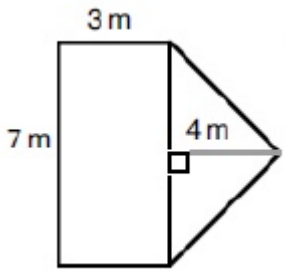
b) A = _____



c) A = _____

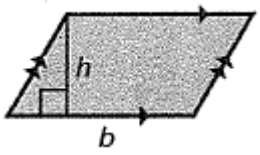
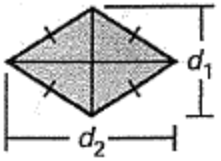


d) A = _____



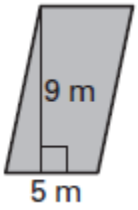
8.5 Area of Parallelograms

Goal: Find the area of parallelograms.

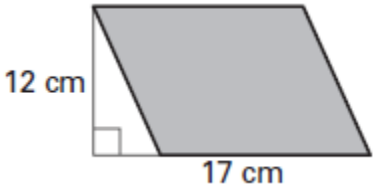
Area of a Parallelogram	Area of a Rhombus
 A = _____	 A = _____

Find the area of the parallelogram.

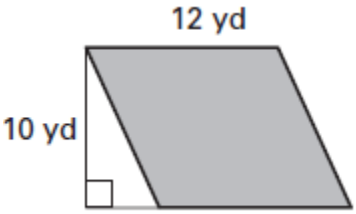
a) A = _____



b) A = _____



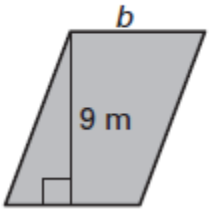
c) A = _____



***A* gives the area of the parallelogram. Find the missing measure.**

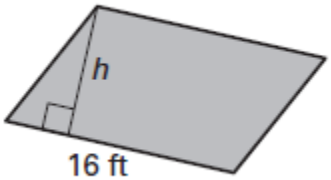
a) _____

$A = 63\ \text{m}^2$



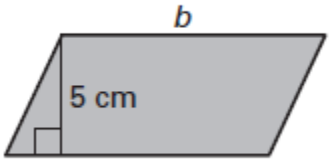
b) _____

$A = 144\ \text{ft}^2$



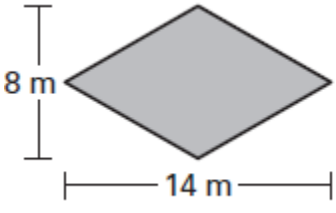
c) _____

$A = 55\ \text{cm}^2$

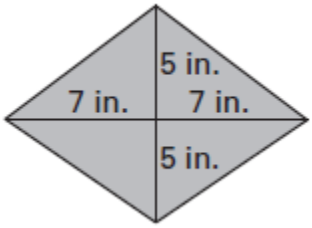


Find the area of the rhombus.

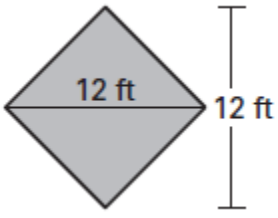
a) A = _____



b) A = _____

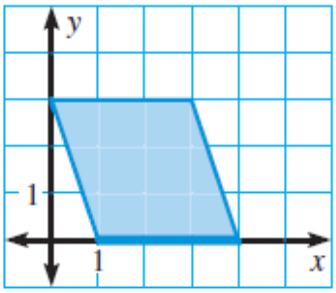


c) A = _____

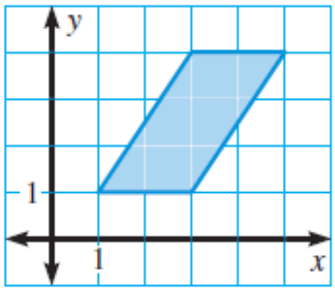


Find the area of each parallelogram.

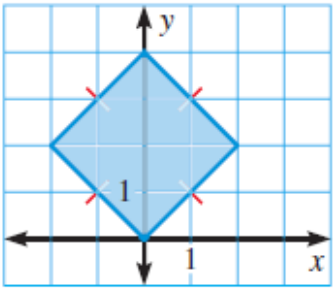
a) A = _____



b) A = _____

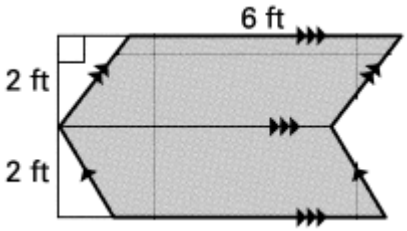


c) A = _____

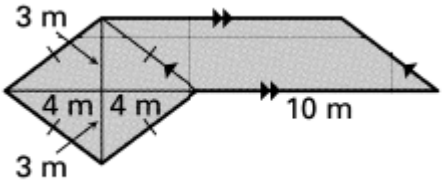


Find the area of each compound shape.

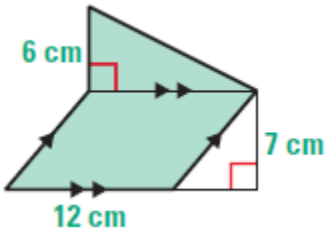
a) A = _____



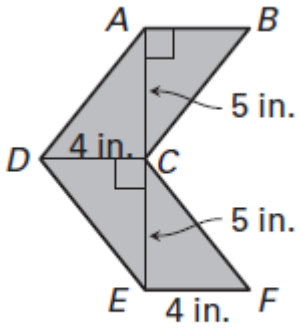
b) A = _____



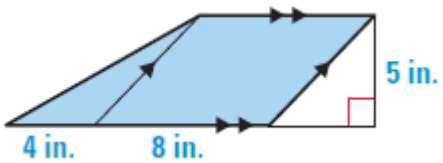
c) A = _____



d) A = _____



e) A = _____



8.6 Area of Trapezoids

Goal: Find the area of trapezoids.

Complete each statement with *always, sometimes*, or *never*.

The bases of the trapezoid are _____ parallel.

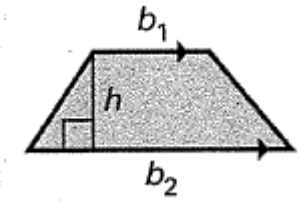
The bases of the trapezoid are _____ congruent.

The bases of a trapezoid are _____ sides of the trapezoid.

The height of a trapezoid is _____ a side of the trapezoid.

The height of a trapezoid is _____ perpendicular to both bases.

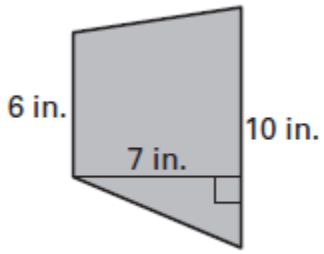
Area of a Trapezoid



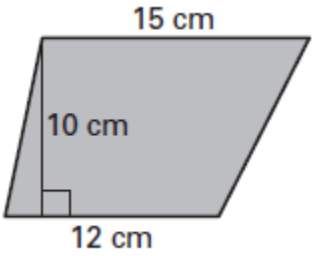
A = _____

Find the area of the trapezoid.

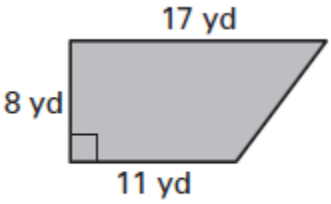
a) A = _____



b) A = _____



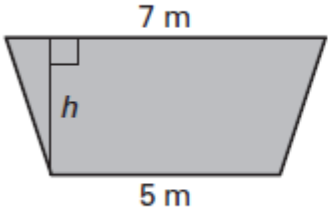
c) A = _____



***A* gives the area of the trapezoid. Find the missing measure.**

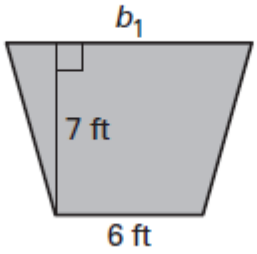
a) _____

$A = 18\ \text{m}^2$



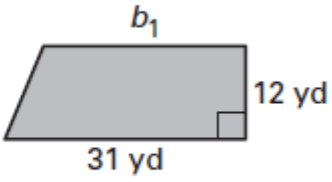
b) _____

$A = 56\ \text{ft}^2$



c) _____

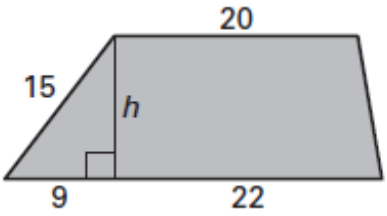
$A = 342\ \text{yd}^2$



Find the height of the trapezoid using the Pythagorean Theorem. Then find the area of the trapezoid.

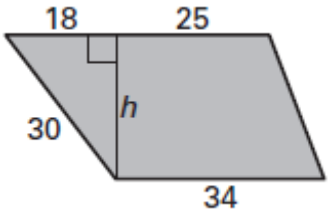
a) h = _____

A = _____



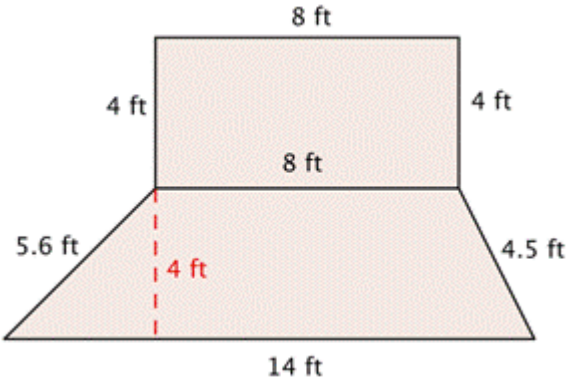
b) h = _____

A = _____

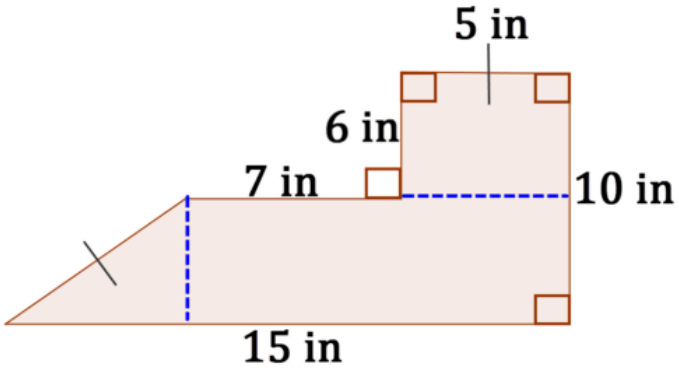


Find the area of the composite figures.

a) A = _____



b) A = _____



8.7 Circumference and Area of Circles

Goal: Find the circumference and area of circles.

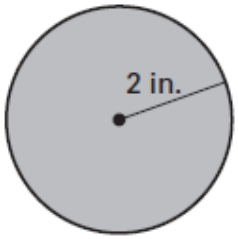
Circle: a set of all points in a plane that are the same _____ from a given point, called the _____ of the circle.

Radius: the distance from the _____ to a point on the circle	
Diameter: the distance _____ the circle, through the center	
Circumference: the distance _____ the circle	
Central angle: an angle whose _____ is the center of the circle	
Sector: a region of a circle determined by two _____ and a part of the circle	

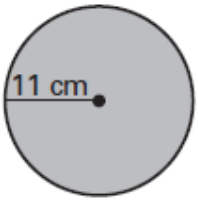
Circumference of a Circle	Area of a Circle
C = _____ or C = _____	A = _____

Find the circumference of the circle. The find the area. Round your answer to the nearest tenth.

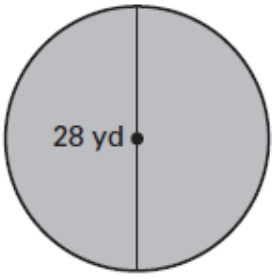
a) C = _____
A = _____



b) C = _____
A = _____



c) C = _____
A = _____



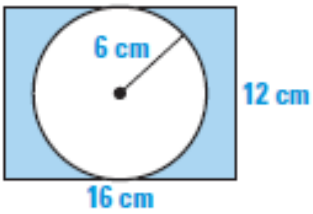
The area of the circle is given. Find the radius.

a) r = _____ b) r = _____ c) r = _____

$A = 50\ cm^2$ $A = 452\ in^2$ $A = 28\ ft^2$

Find the area of the shaded region.

a)

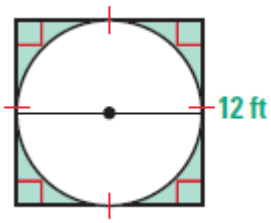


Area of Rectangle: _____

Area of Circle: _____

Area of Shaded: _____

b)



Area of Rectangle: _____

Area of Circle: _____

Area of Shaded: _____

Area of a Sector
_____ = _____

Find the area of the sector. Round your answer to the nearest tenth.

a) A = _____ b) A = _____ c) A = _____