Chapter 7

Chapter Review

Vocabulary

adjacent arcs (p. 387)
altitude of a parallelogram (p. 349)
apothem of a regular polygon (p. 380)
arc length (p. 389)
base of a parallelogram (p. 349)
base of a triangle (p. 350)
center of a circle (p. 386)
center of a regular polygon (p. 380)
central angle (p. 386)
circle (p. 386)
circumference (p. 388)
concentric circles (p. 388)
congruent arcs (p. 389)
congruent circles (p. 386)
diameter (p. 386)
geometric probability (p. 402)
height of a parallelogram (p. 349)
height of a trapezoid (p. 374)
height of a triangle (p. 350)
major arc (p. 387)
minor arc (p. 387)
pi (p. 388)
Pythagorean triple (p. 357)
radius (p. 386)
radius of a regular polygon (p. 380)
sector of a circle (p. 396)
segment of a circle (p. 397)
semicircle (p. 387)

Reading Math
Understanding Vocabulary

Choose the correct term to complete each sentence.

1. You can use any side as the (*altitude, base*) of a triangle.

2. A (*sector, segment*) of a circle is a region bounded by two radii and the intercepted arc.

3. A segment that contains the center of a circle and has both endpoints on the circle is the (*diameter, circumference*) of a circle.

4. In a regular polygon, the perpendicular distance from the center to a side is the (*apothem, radius*) of the parallelogram.

5. Two arcs of a circle with exactly one point in common are (*congruent arcs, adjacent arcs*).

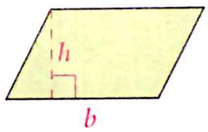
Take It to the NET
Online vocabulary quiz at www.PHSchool.com
Web Code: afj-0751

Skills and Concepts

7-1, 7-4, and 7-5 Objectives

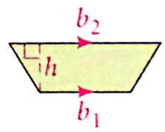
- To find the area of a parallelogram
- To find the area of a triangle
- To find the area of a trapezoid
- To find the area of a rhombus or a kite
- To find the area of a regular polygon

You can find the area of a rectangle, a parallelogram, or a triangle if you know the **base,** b, and **height,** h. The area of a rectangle or a parallelogram is $A = bh$.

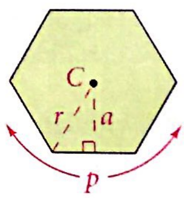


The area of a triangle is $A = \frac{1}{2}bh$.

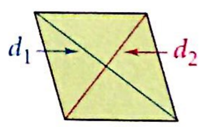
The **height of a trapezoid,** h, is the perpendicular distance between the bases, b_1 and b_2. The area of a trapezoid is $A = \frac{1}{2}h(b_1 + b_2)$.



The **center of a regular polygon,** C, is the center of its circumscribed circle. The **radius,** r, is the distance from the center to a vertex. The **apothem,** a, is the perpendicular distance from the center to a side. The area of a regular polygon with apothem a and perimeter p is $A = \frac{1}{2}ap$.



The area of a rhombus or kite is $A = \frac{1}{2}d_1d_2$.



Find the area of each figure. If your answer is not an integer, leave it in simplest radical form.

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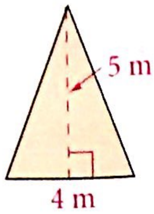

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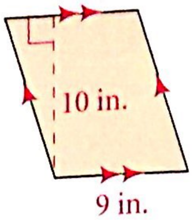

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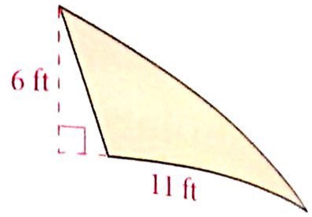

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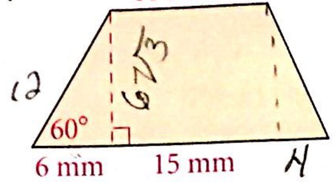

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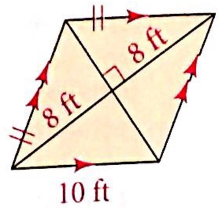

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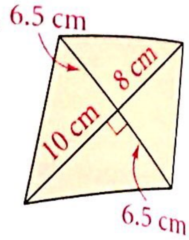

Sketch each regular polygon with the given radius. Then find its area. Round your answers to the nearest tenth.

12. triangle; radius 4 in. **13.** square; radius 8 mm **14.** hexagon; radius 7 cm

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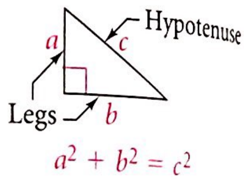
7-2 and 7-3 Objectives

- To use the Pythagorean Theorem
- To use the Converse of the Pythagorean Theorem
- To use properties of 45°-45°-90° triangles
- To use properties of 30°-60°-90° triangles

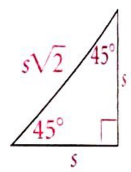
The **Pythagorean Theorem** states that in a right triangle, the sum of the squares of the lengths of the legs equals the square of the length of the hypotenuse, or $a^2 + b^2 = c^2$.



Positive integers a, b, and c form a **Pythagorean triple** if $a^2 + b^2 = c^2$.

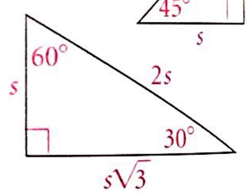
The **Converse of the Pythagorean Theorem** states that if the square of the length of one side of a triangle is equal to the sum of the squares of the lengths of the other two sides, then the triangle is a right triangle.

In a triangle with longest side c, if $c^2 > a^2 + b^2$, the triangle is obtuse; if $c^2 < a^2 + b^2$, the triangle is acute.



In a 45°-45°-90° triangle, the legs are congruent and the length of the hypotenuse is $\sqrt{2}$ times the length of a leg.

In a 30°-60°-90° triangle, the length of the hypotenuse is twice the length of the shorter leg. The length of the longer leg is $\sqrt{3}$ times the length of the shorter leg.



Find the value of each variable. If your answer is not an integer, leave it in simplest radical form.

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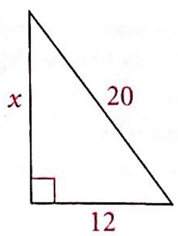

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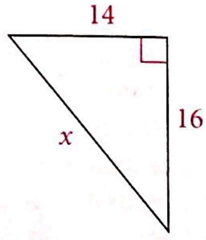

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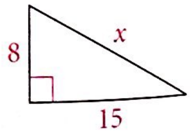

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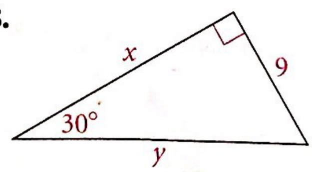

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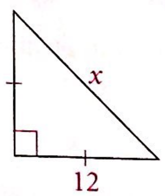

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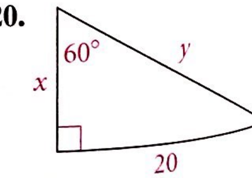
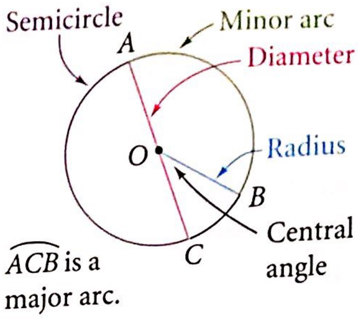


7-6 and 7-7 Objectives

- To find the measures of central angles and arcs
- To find circumference and arc length
- To find the areas of circles, sectors, and segments of circles

A **circle** is the set of all points in a plane equidistant from one point called the **center.** The measure of a **minor arc** is the measure of its corresponding central angle. The measure of a **major arc** is 360 minus the measure of its related minor arc. **Adjacent arcs** have exactly one point in common.

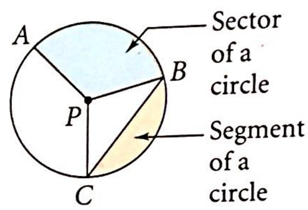


The **circumference** of a circle is $C = \pi d$ or $C = 2\pi r$. The area of a circle is $A = \pi r^2$.

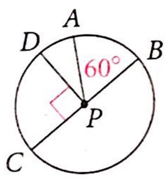
Arc length is a fraction of a circle's circumference.
The length of $\widehat{AB} = \frac{m\widehat{AB}}{360} 2\pi r$.

A **sector of a circle** is a region bounded by two radii and their intercepted arc.
The area of sector $APB = \frac{m\widehat{AB}}{360} \pi r^2$.

A **segment of a circle** is the part of a circle bounded by an arc and the segment joining its endpoints. The area of a segment of a circle is the difference between the areas of the related sector and the related triangle.



Find each measure.

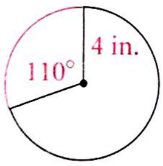


21. $m\angle APD$ **22.** $m\widehat{AC}$

23. $m\widehat{ABD}$ **24.** $m\angle CPA$

Find the length of each arc shown in red. Leave your answer in terms of π.

25.



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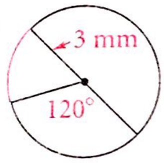

Find the area of each shaded region. Round your answer to the nearest tenth.

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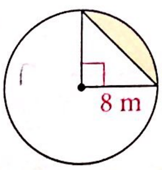

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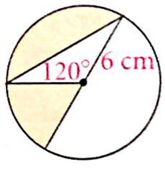


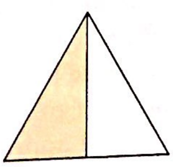
7-8 Objectives

- To use segment and area models to find the probabilities of events

Geometric probability uses geometric figures to represent occurrences of events. You can use a segment model or an area model. Compare the part that represents favorable outcomes to the whole, which represents all outcomes.

A dart hits each dartboard at a random point. Find the probability that it lands in the shaded area.

29.



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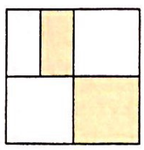

31.