

Area Unit

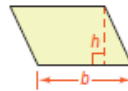
10-1 Transformations

Vocabulary

-Area, Base, Altitudes, Height

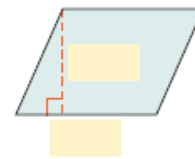
Area of Parallelogram

The area of a parallelogram is the product of a base and the corresponding height.

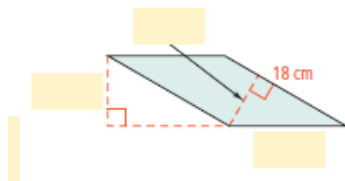


$$A = bh$$

Got It? What is the area of a parallelogram with base length 12 m and height 9 m?



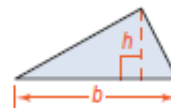
Got It? A parallelogram has sides 15 cm and 18 cm. The height corresponding to a 15-cm base is 9 cm. What is the height corresponding to an 18-cm base?



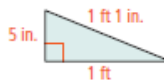
Area of Triangle

The area of a triangle is half the product of a base and the corresponding height.

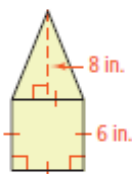
$$A = \frac{1}{2}bh$$



Got It? What is the area of the triangle?



Sum of Areas



What is the total area of the figure?

10-2 Areas of Trapezoids, Rhombuses, Kites

Reminder About Special Triangles

Pythagorean Theorem

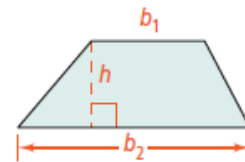
30-60-90 Triangles

45-45-90 Triangles

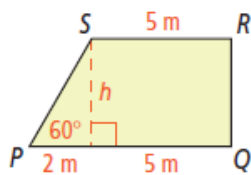
Area of Trapezoids

The area of a trapezoid is half the product of the height and the sum of the bases.

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



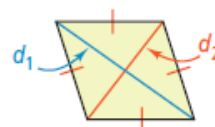
Find the area of the trapezoid below.



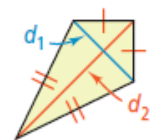
Area of a Rhombus or Kite

The area of a rhombus or a kite is half the product of the lengths of its diagonals.

$$A = \frac{1}{2}(d_1 d_2)$$

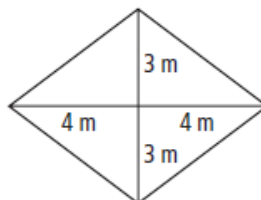
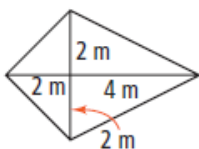


Rhombus



Kite

Find the lengths of the diagonals of the kite and the rhombus below.

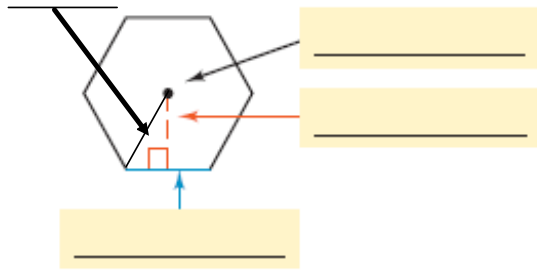


10-3 Area of Regular Polygons

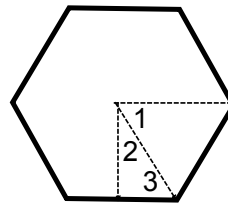
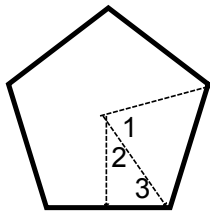
Vocabulary

-Radius of a Regular Polygon, Apothem

(note: apothems bisect vertex angles)



Finding Angle Measurements



Area of a Regular Polygon

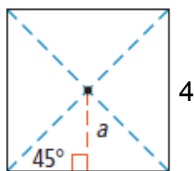
The area of a regular polygon is half the product of the apothem and the perimeter.

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

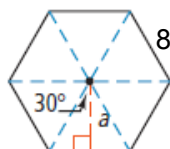
Find the areas of the regular polygons below.

A pentagon with apothem of 10cm and side of 16cm.

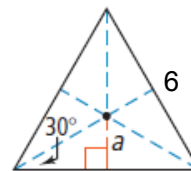
square



regular hexagon



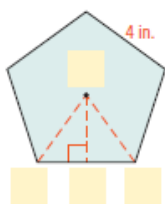
equilateral triangle



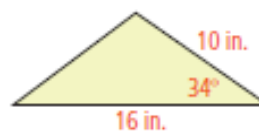
10-5 Trigonometry and Area

Using Trig to Find Area

Got It? What is the area of a regular pentagon with 4-in. sides? Round your answer to the nearest square inch.



Got It? What is the area of the triangle? Round your answer to the nearest square inch.



10-6 Circles and Arcs

Vocabulary

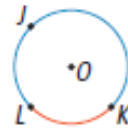
-Center, Diameter, Central Angle, Radius, Semicircle, Major Arc, Minor Arc, Concentric Circles, Arc Length

Naming Arcs

Use the arc symbol with 2 or 3 letters that identify the arc.

Minor arcs are typically named with 2 letters. \widehat{LK}

Major arcs are typically named with 3 letters. \widehat{JLK}



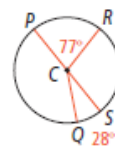
Measuring Arcs

The measure of a minor arc is equal to the measure of its corresponding central angle.

The measure of a major arc is the measure of the related minor arc subtracted from 360.

The measure of a semicircle is 180.

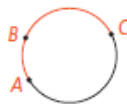
From the diagram at the right, find all the measures of the arcs.



Arc Addition Postulate

The measure of the arc formed by two adjacent arcs is the sum of the measures of the two arcs.

$$m\widehat{ABC} = m\widehat{AB} + m\widehat{BC}$$



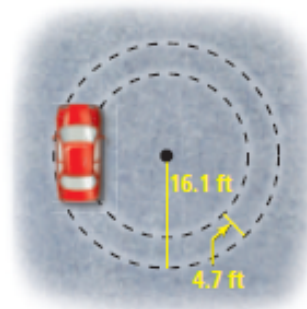
Circumference of a Circle

The circumference of a circle is π times the diameter.

$$C = \pi d \text{ or } C = 2\pi r$$



Got It? A car has a circular turning radius of 16.1 ft. The distance between the two front tires is 4.7 ft. How much farther does a tire on the outside of the turn travel than a tire on the inside?

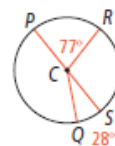


Finding Arc Length

The length of an arc of a circle is the product of the ratio $\frac{\text{measure of the arc}}{360}$ and the circumference of the circle.

$$\text{Arc Length} = \frac{m\widehat{AB}}{360} \cdot 2\pi r$$

Find the arc length of arc RS in the figure at the right.



10-7 Areas of Circles and Sectors

Vocabulary

-Sector of a Circle, Segment of a Circle, pi

Area of a Circle

The area of a circle is the product of π and the square of the radius.

$$A = \pi r^2$$

Got It? What is the area of a circular wrestling region with a 42-ft diameter?



Areas of Sectors

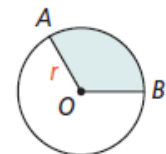
Definition: A sector of a circle is a region bounded by an arc of the circle and the two radii to the arc's endpoints.

Main Idea: The area of a sector is a fractional part of the area of a circle.

The area of a sector of a circle is the product of the ratio $\frac{\text{measure of the arc}}{360}$ and the area of the circle.

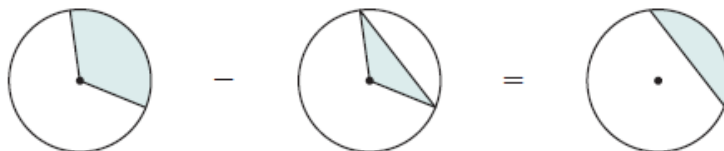
$$\text{Area of sector } AOB = \frac{m\widehat{AB}}{360} \cdot \pi r^2$$

What is the area of a sector with an arc of 90 degrees and a radius of 2cm?



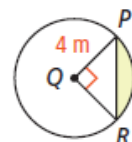
Areas of Segments

The area of a segment is the difference of the area of the sector and the area of the triangle formed by the radii and the segment joining the endpoints.



Area of sector — Area of triangle = Area of segment

Got It? What is the area of the shaded segment shown at the right? Round your answer to the nearest tenth.



10-8 Geometric Probability

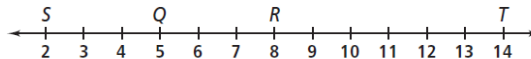
Geometric Probability

Main Idea: In geometric **probability**, favorable outcomes and possible outcomes are geometric measures such as lengths of segments or areas of regions.

$$P(\text{event}) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

Probability and Length

Got It? Point H on \overline{ST} is selected at random.
What is the probability that H lies on \overline{SR} ?



Probability and Area

Got It? A triangle is inscribed in a square.
Point T in the square is selected at random.
What is the probability that T lies in the shaded region?

