

TOPIC 8

Solve Problems Involving Geometry

In this topic, students explore geometry, beginning with two-dimensional figures and moving to three-dimensional figures. Students extend their understanding of proportional relationships to scaled drawings, and to the relationship between circumference and diameter of a circle. They learn about side and angle relationships in triangles and angles formed by intersecting lines. Then they explore surface area and volume of prisms, pyramids and composite shapes.


CONNECT THE MATH

Scale drawings have many applications. Architects use scale drawings to design buildings. Maps are a specific type of scale drawing designed to represent the distance between locations of the world. City planners use scale drawings to represent the streets, buildings and open spaces of a city.

A scale drawing can make information and calculations more manageable. The foreman of a construction crew can use the measurements from a blueprint (a type of scale drawing) to calculate the amount of concrete they need to purchase for the foundation of a



building. The measurements in the drawing can represent two-dimensional and three-dimensional measurements in the real world at a different scale.



LESSON 8-1

Solve Problems Involving Scale Drawings

Scale drawings can be used to calculate actual measures and reproduce proportional scale drawings.

LESSON OBJECTIVES

- Use a scale drawing as a representation of actual lengths and areas.

HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Use the Scale on a Map to Find an Actual Distance?](#)
- [How Do You Find the Scale of a Model?](#)
- [What Is a Scale Drawing?](#)

Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- [scale drawing](#)

You can use these search terms and phrases to help your student find additional help online:

- finding actual lengths from a scale drawing
 - finding actual area from a scale drawing
 - using proportional reasoning with scale drawings
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LESSON 8-2

Draw Geometric Figures

Geometric shapes can be drawn freehand, with tools, and with technology given side lengths, angle measures, and side or angle relationships.

LESSON OBJECTIVES

- Draw geometric shapes with given conditions.
 - Name and classify quadrilaterals according to their properties.
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HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Draw Geometric Figures Given Conditions?](#)

You can use these search terms and phrases to help your student find additional help online:

- drawing geometric figures
 - using a ruler and protractor
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LESSON 8-3

Draw Triangles with Given Conditions

A set of given conditions for the measure of angles and/or side lengths of a triangle may result in being able to draw exactly one triangle, more than one triangle, or no triangle at all.

LESSON OBJECTIVES

- Sketch and construct triangles with given conditions.
 - Determine the number of triangles that can be formed given side lengths and angle measures.
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HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Determine Whether a Triangle Can Be Formed Given Three Side Lengths?](#)
- [How Do You Find a Range of Possible Lengths for a Side of a Triangle?](#)

You can use these search terms and phrases to help your student find additional help online:

- drawing triangles with given side lengths
 - determining whether or not a triangle can be formed from given side lengths
 - finding possible side lengths for a triangle
 - drawing triangles with given side lengths and angle measures
 - drawing triangles with three given angle measures
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LESSON 8-4

Solve Problems Using Angle Relationships

The measure of angles that are formed by intersecting lines and rays can be determined when the relationships between different types of angles are known.

LESSON OBJECTIVES

- Find the measure of angles using angle relationships.
 - Recognize the relationship between different angles formed by intersecting lines and rays.
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HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [What Are Vertical Angles?](#)
- [What Are Complementary Angles?](#)

Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- [adjacent angles](#)
- [complementary angles](#)
- [supplementary angles](#)
- [vertical angles](#)

You can use these search terms and phrases to help your student find additional help online:

- finding vertical angles
- finding adjacent angles
- finding complementary angles
- finding supplementary angles
- finding the measure of an unknown angle by using angle relationships



LESSON 8-5

Solve Problems Involving Circumference of a Circle

A proportional relationship exists between the circumference and diameter of a circle. The ratio of circumference to diameter is an irrational number that is symbolized by pi (π).

LESSON OBJECTIVES

- Calculate the circumference, radius, or diameter of a circle.
- Recognize the relationship between circumference of a circle, diameter of a circle, and π .

HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [What Is Circumference?](#)
- [How Do You Find the Radius of a Circle If You Know the Circumference?](#)

Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- [circumference](#)

You can use these search terms and phrases to help your student find additional help online:

- identifying parts of a circle
- finding the diameter of a circle from its circumference



LESSON 8-6

Solve Problems Involving Area of a Circle

The formula for the area of a circle, $A = \pi r^2$, can be used to solve problems by substituting the known values for area (A) or radius (r) to solve for the missing variable.

LESSON OBJECTIVES

- Find area of a circle.
- Use the area of a circle to find the radius and diameter.
- Solve problems involving the area of a circle.


HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [What Is the Formula for the Area of a Circle?](#)
- [How Do You Find the Radius of a Circle if You Know the Area?](#)

You can use these search terms and phrases to help your student find additional help online:

- finding area of a circle
 - finding area of part of a circle
 - using circumference to find area
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LESSON 8-7

Describe Cross Sections

A cross section is a two-dimensional figure that is exposed when a three-dimensional figure is sliced by a plane. A cross section of a rectangular prism has the same shape and size as the faces parallel to the slice. A cross section parallel to the base of a right rectangular pyramid results in a smaller rectangle with sides that are proportional to the sides of the base. A cross section perpendicular to the base and through the vertex of a right rectangular pyramid results in an isosceles triangle that has the same height as the pyramid.

LESSON OBJECTIVES

- Describe and sketch cross sections of right rectangular prisms and right rectangular pyramids.
 - Solve problems involving cross sections.
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HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Analyze Cross Sections of Pyramids and Rectangular Prisms?](#)

You can use these search terms and phrases to help your student find additional help online:

- describing cross sections of right rectangular prisms
 - describing cross sections of right rectangular pyramids
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LESSON 8-8

Solve Problems Involving Surface Area

The surface area of a composite figure is the sum of the areas of the shapes that

make up the composite figure. The surface area of a three-dimensional figure is the combined surface areas of all faces of the figure.

LESSON OBJECTIVES

- Find the surface area of 2-dimensional composite shapes.
 - Find the surface area of 3-dimensional composite shapes.
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HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Find the Area of a Composite Figure?](#)
- [How Do You Find the Surface Area of a Rectangular Prism Using a Net?](#)

You can use these search terms and phrases to help your student find additional help online:

- finding the area of composite figures
 - finding the surface area of a composite figure
 - finding the surface area using a net
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LESSON 8-9

Solve Problems Involving Volume

The volume of a three-dimensional right prism is equal to the area of its base multiplied by its height.

LESSON OBJECTIVES

- Calculate the volume of various three-dimensional figures composed of prisms.
- Solve problems involving the volume of three-dimensional figures.

HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Find the Volume of a Composite Figure?](#)
- [What is the Formula for the Volume of a Prism?](#)

Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- [composite figure](#)

You can use these search terms and phrases to help your student find additional help online:

- finding the volume of prisms
- finding the volume of a composite figure