

CHAPTER 9

Geometry and Measurement

What You've Learned

- In Chapter 1, you used the Pythagorean Theorem to find the length of the hypotenuse of a right triangle.
- You used the Pythagorean Theorem to find other missing measurements of right triangles.
- In Chapter 3, you used proportions for indirect measurements.



Check Your Readiness

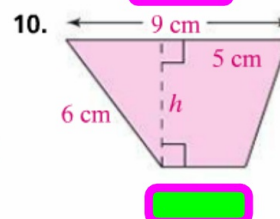
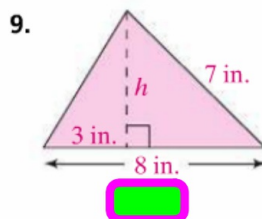
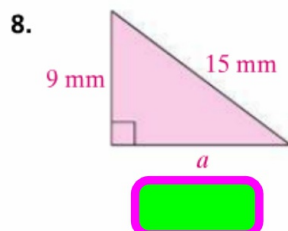
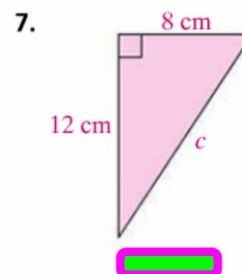
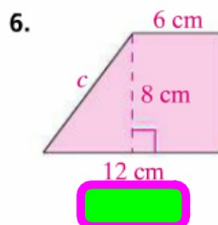
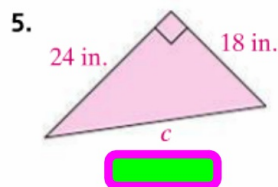
Solving Proportions

Solve each proportion.

1. $\frac{x}{4} = \frac{15}{20}$ 2. $\frac{a}{9} = \frac{21}{27}$ 3. $\frac{26}{5} = \frac{13}{b}$ 4. $\frac{10}{h} = \frac{30}{36}$

Using the Pythagorean Theorem

Use the Pythagorean Theorem to find each unknown measure. Round to the nearest whole number.



9-1

Solids

What You'll Learn

To identify solids, parts of solids, and skew line segments

New Vocabulary solids, prism, pyramid, cylinder, cone, polyhedron, skew lines

© CONTENT STANDARDS

8.G.9

Why Learn This?

Our world is made up of largely three-dimensional figures, or solids. Artists use three-dimensional figures in sculptures.

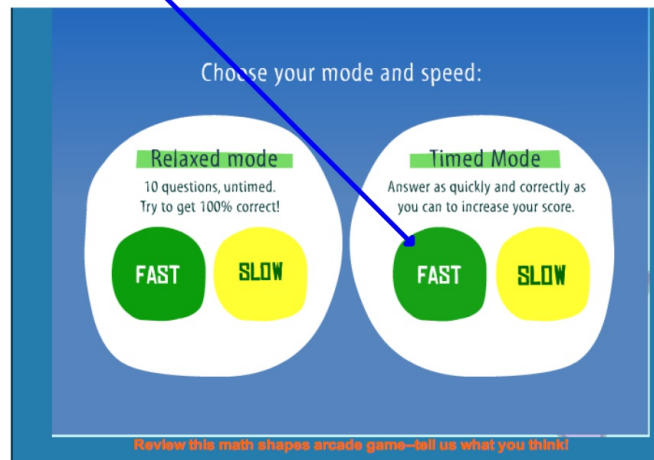
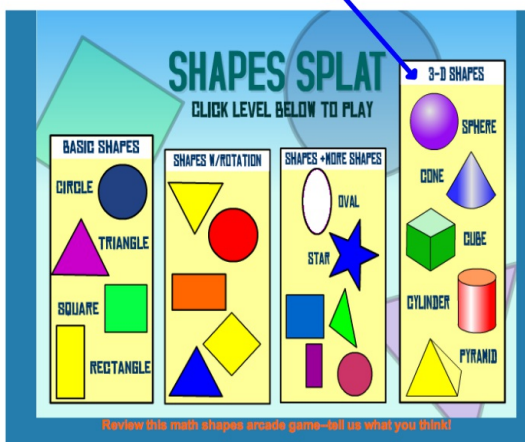


Check your email for this link.

http://www.sheppardsoftware.com/mathgames/earlymath/shapes_shoot.htm

We will do the 3-D shapes

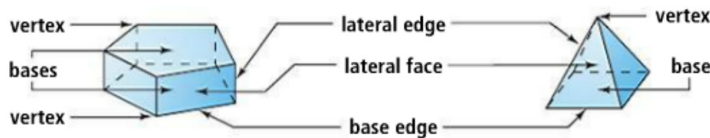
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Solids are objects that do not lie flat in a plane. They have length, width, and height. Below are some common solids.

A **prism** is a solid with two parallel bases that are congruent polygons. The lateral faces are parallelograms.

A **pyramid** is a solid with exactly one base, which is a polygon. The lateral faces are triangles.

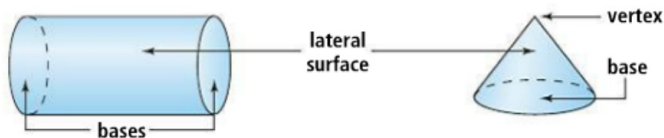


A prism is named for the shape of its bases. The prism above is a pentagonal prism.

A pyramid is named for the shape of its base. The pyramid above is a square pyramid.

A **cylinder** is a solid with two bases that are parallel, congruent circles.

A **cone** is a solid with exactly one circular base and one vertex.

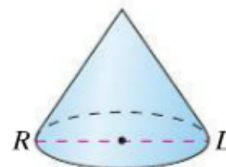


A **polyhedron** is a solid whose faces are polygons. Of the solids above, only prisms and pyramids are polyhedrons.

EXAMPLE Naming Solids and Their Parts

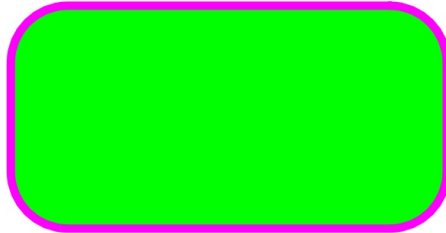
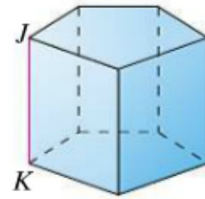
- 1 Refer to the figure at the right. Describe the base, name the figure, and name \overline{RL} .

The only base is a circle. The figure is a cone. \overline{RL} is a diameter.



 **Quick Check**

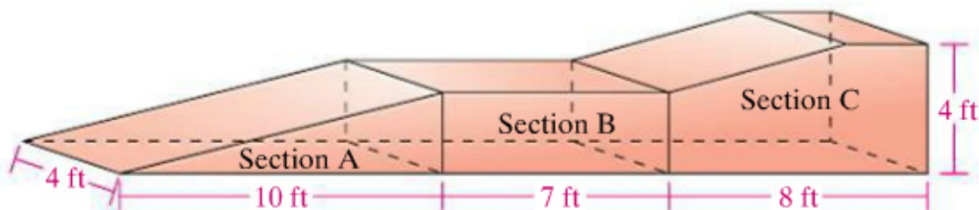
1. Refer to the figure at the right. Name the figure, \overline{JK} , and the points J and K .



Common solids are everywhere. Often, solids form complex structures.

EXAMPLE **Recognizing Solids**

- 2 **Set Design** A stage crew for the school play constructed the ramp shown. Name the three solids used to construct the ramp.



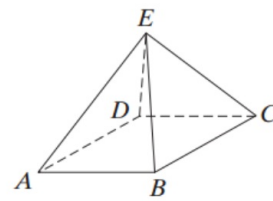
Section A is a triangular prism. Section B is a rectangular prism. Section C is a pentagonal prism.

Examples

- ① **Naming Solids and Their Parts** In the figure at right, describe the base, name the figure, and name the part labeled \overline{CD} .

The base is a . The figure is a rectangular pyramid.

\overline{CD} is a .



- ② **Recognizing Solids** Which common solids make up this toy?

The box is a . The head is a sphere.

The hat is a with a on top.



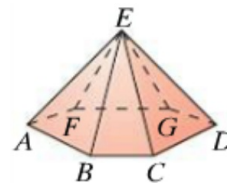
Skew lines are lines that do not intersect and are not parallel. Unlike parallel or intersecting lines, skew lines do not lie in the same plane.

EXAMPLE

Identifying Skew Line Segments

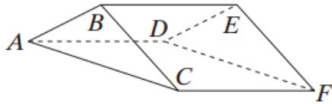
- ③ Name a pair of skew line segments and a pair of parallel line segments in the figure at the right.

\overline{AF} and \overline{ED} are skew. \overline{BC} and \overline{FG} are parallel.



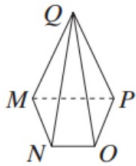
3 Identifying Skew Line Segments For each figure, name a pair of skew line segments, a pair of parallel line segments, and a pair of intersecting line segments.

a.



\overline{BC} and \overline{DE} are skew. \overline{AB} and \overline{DE} are parallel.
 \overline{BC} and \overline{BE} intersect.

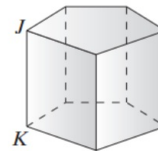
b.



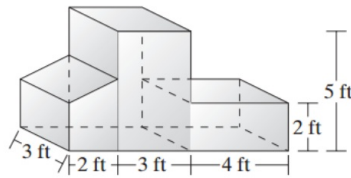
\overline{MP} and \overline{QO} are skew. \overline{MP} and \overline{NO} are parallel.
 \overline{QP} and \overline{PO} intersect.

Quick Check

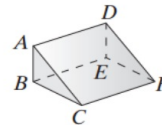
1. Refer to the figure at the right. Name the figure, \overline{JK} , and the points J and K .



2. What common solids will a stage crew use to build the stage prop at right?



3. For the figure at the right, name a pair of intersecting line segments.



Check Your Understanding

1. **Vocabulary** What is the difference between parallel lines and skew lines?

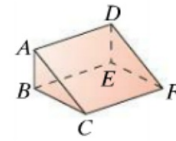
Use the figure at the right for Exercises 2–4.

2. The bases are two ?.

3. The figure is a ? prism.

4. \overline{CF} is a (lateral face, lateral edge).

5. The three solids that make up the pencil shown below are a hexagonal prism, a cone, and a ?.

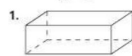


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Practice 9-1

Solids

For each figure, describe the base(s) of the figure, and name the figure.









Name the solid that describes each item.

5. bowling ball

6. DVD player

7. soup can

Complete.

8. A _____ has exactly two circular bases.

9. A hexagonal prism has _____ faces.

10. A cube has _____ edges.

11. A pentagonal pyramid has _____ faces.

Name the figure described.

12. a space figure with six congruent square faces

13. a space figure with parallel bases that are congruent, parallel circles

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