

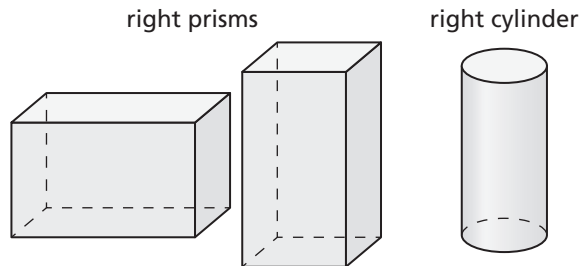
11.5**Volumes of Prisms and Cylinders**

For use with Exploration 11.5

Essential Question How can you find the volume of a prism or cylinder that is not a right prism or right cylinder?

Recall that the volume V of a right prism or a right cylinder is equal to the product of the area of a base B and the height h .

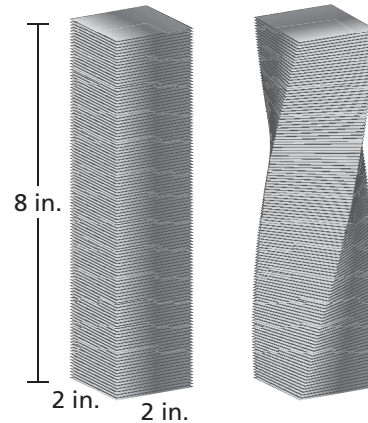
$$V = Bh$$

**1 EXPLORATION: Finding Volume**

Work with a partner. Consider a stack of square papers that is in the form of a right prism.

a. What is the volume of the prism?

b. When you twist the stack of papers, as shown at the right, do you change the volume? Explain your reasoning.

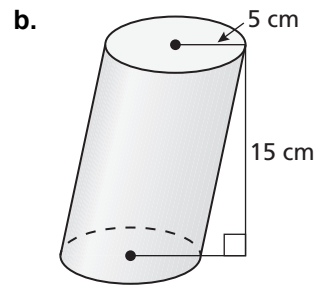
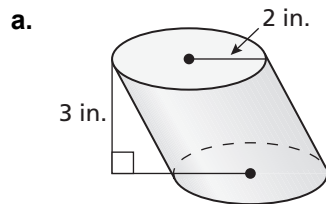


c. Write a carefully worded conjecture that describes the conclusion you reached in part (b).

d. Use your conjecture to find the volume of the twisted stack of papers.

11.5 Volumes of Prisms and Cylinders (continued)**2** **EXPLORATION:** Finding Volume

Work with a partner. Use the conjecture you wrote in Exploration 1 to find the volume of the cylinder.

**Communicate Your Answer**

- How can you find the volume of a prism or cylinder that is not a right prism or right cylinder?
- In Exploration 1, would the conjecture you wrote change if the papers in each stack were not squares? Explain your reasoning.

11.5**Notetaking with Vocabulary**

For use after Lesson 11.5

In your own words, write the meaning of each vocabulary term.

volume

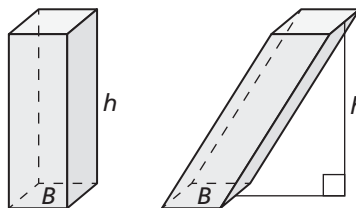
Cavalieri's Principle

density

similar solids

Core Concepts**Volume of a Prism**The volume V of a prism is

$$V = Bh$$

where B is the area of a base and h is the height.**Notes:**

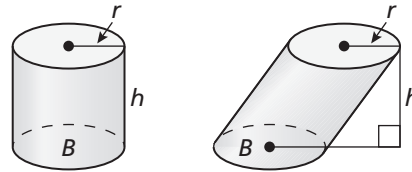
11.5 Notetaking with Vocabulary (continued)

Volume of a Cylinder

The volume V of a cylinder is

$$V = Bh = \pi r^2 h$$

where B is the area of a base, h is the height, and r is the radius of a base.



Notes:

Similar Solids

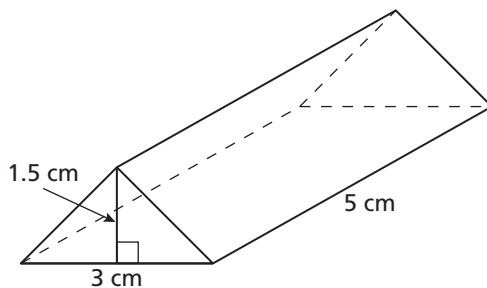
Two solids of the same type with equal ratios of corresponding linear measures, such as heights or radii, are called **similar solids**. The ratio of the corresponding linear measures of two similar solids is called the *scale factor*. If two similar solids have a scale factor of k , then the ratio of their volumes is equal to k^3 .

Notes:

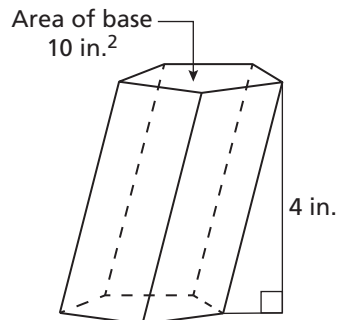
Extra Practice

In Exercises 1 and 2, find the volume of the prism.

1.

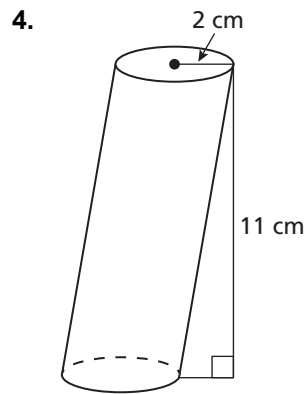
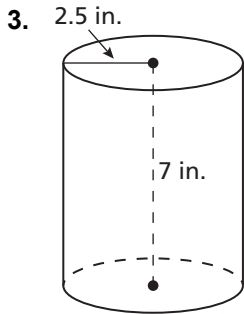


2.



11.5 Notetaking with Vocabulary (continued)

In Exercises 3 and 4, find the volume of the cylinder.



In Exercises 5 and 6, find the indicated measure.

5. height of a cylinder with a base radius of 8 inches and a volume of 2010 cubic inches

6. area of the base of a pentagonal prism with a volume of 50 cubic centimeters and a height of 7.5 centimeters

In Exercises 7 and 8, find the missing dimension of the prism or cylinder.

