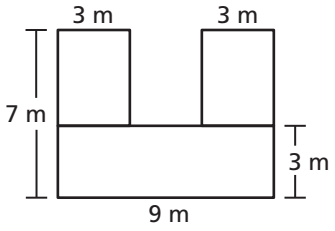
Name_____ Date _____

Chapter 8 Fair Game Review

Find the area of the figure.

1.



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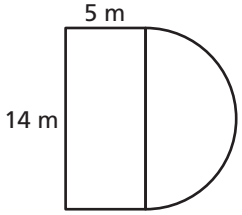

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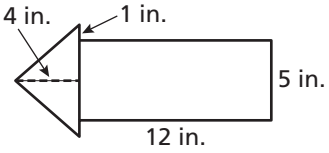

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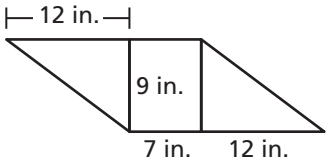
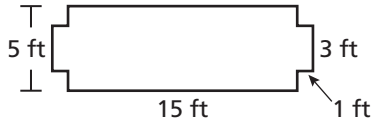
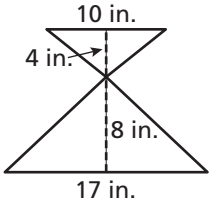


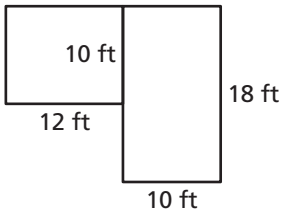
5.



6.



7. You are carpeting 2 rooms of your house. The carpet costs $1.48 per square foot. How much does it cost to carpet the rooms?



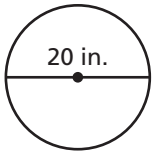
Name _____ Date _____

Chapter 8

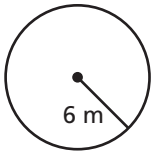
Fair Game Review (continued)

Find the area of the circle.

8.



9.



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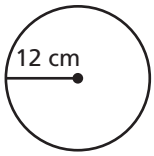

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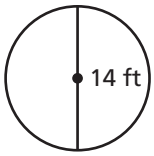

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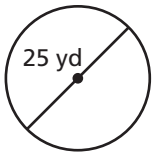
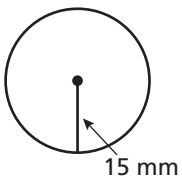
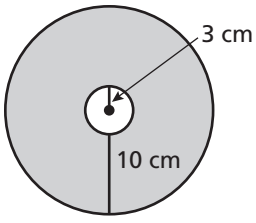


13.



14. Find the area of the shaded region.



Name_____ Date _____

8.1 Volumes of Cylinders

For use with Activity 8.1

Essential Question How can you find the volume of a cylinder?

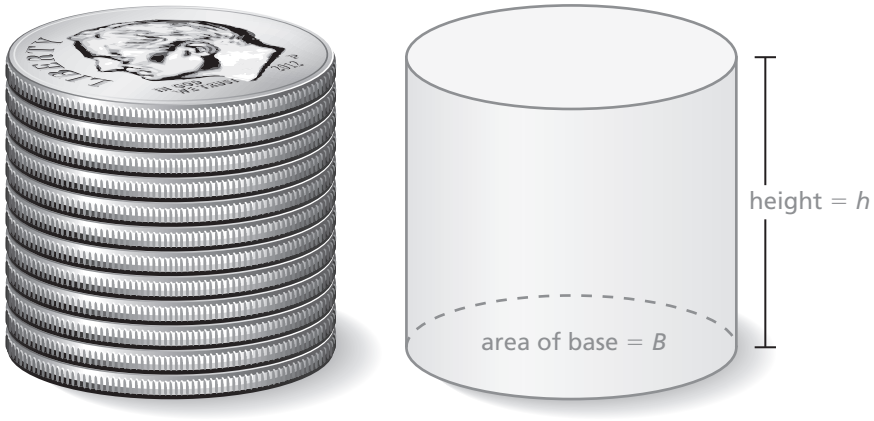
1 ACTIVITY: Finding a Formula Experimentally

Work with a partner.

a. Find the area of the face of a coin.

b. Find the volume of a stack of a dozen coins.

c. Write a formula for the volume of a cylinder.



Name _____ Date _____

2 ACTIVITY: Making a Business Plan

Work with a partner. You are planning to make and sell three different sizes of cylindrical candles. You buy 1 cubic foot of candle wax for $20 to make 8 candles of each size.

a. Design the candles. What are the dimensions of each size of candle?

b. You want to make a profit of $100. Decide on a price for each size of candle.

c. Did you set the prices so that they are proportional to the volume of each size of candle? Why or why not?

3 ACTIVITY: Science Experiment

Work with a partner. Use the diagram to describe how you can find the volume of a small object.

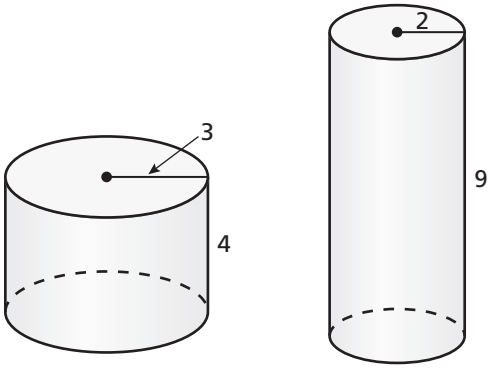
Name_____ Date _____

8.1 Volumes of Cylinders (continued)

4 ACTIVITY: Comparing Cylinders

Work with a partner.

a. Just by looking at the two cylinders, which one do you think has the greater volume? Explain your reasoning.



b. Find the volume of each cylinder. Was your prediction in part (a) correct? Explain your reasoning.

What Is Your Answer?

5. IN YOUR OWN WORDS How can you find the volume of a cylinder?

6. Compare your formula for the volume of a cylinder with the formula for the volume of a prism. How are they the same?

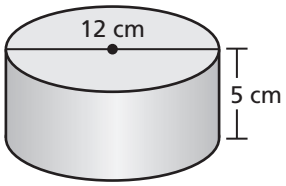
Name _____ Date _____

8.1 Practice

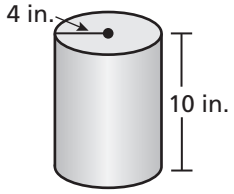
For use after Lesson 8.1

Find the volume of the cylinder. Round your answer to the nearest tenth.

1.

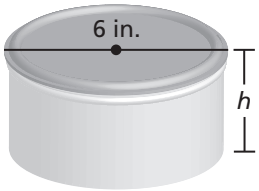


2.

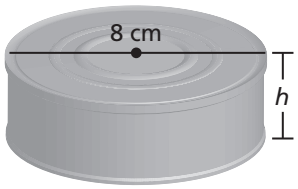


Find the missing dimension of the cylinder. Round your answer to the nearest whole number.

3. Volume = 84 $in.^3$



4. Volume = 650 cm^3



5. To make orange juice, the directions call for a can of orange juice concentrate to be mixed with three cans of water. What is the volume of orange juice that you make?

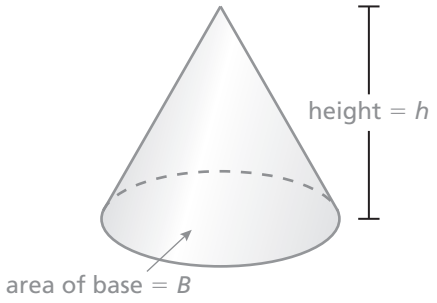
Name_____ Date _____

8.2 Volumes of Cones

For use with Activity 8.2

Essential Question How can you find the volume of a cone?

You already know how the volume of a pyramid relates to the volume of a prism. In this activity, you will discover how the volume of a cone relates to the volume of a cylinder.



1 ACTIVITY: Finding a Formula Experimentally

Work with a partner. Use a paper cup that is shaped like a cone.

- Estimate the height of the cup.
- Trace the top of the cup on a piece of paper. Find the diameter of the circle.
- Use these measurements to draw a net for a cylinder with the same base and height as the paper cup.

- Cut out the net. Then fold and tape it to form an open cylinder.
- Fill the paper cup with rice. Then pour the rice into the cylinder. Repeat this until the cylinder is full. How many cones does it take to fill the cylinder?
- Use your result to write a formula for the volume of a cone.

Name _____ Date _____

8.2 Volumes of Cones (continued)

2 ACTIVITY: Summarizing Volume Formulas

Work with a partner. You can remember the volume formulas for prisms, cylinders, pyramids, and cones with just two concepts.

Volumes of Prisms and Cylinders

Volume = | Area of base | × | |

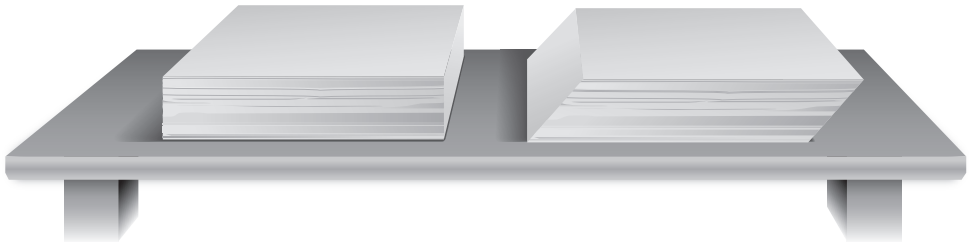
Volumes of Pyramids and Cones

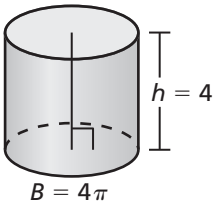
Volume = | | Volume of prism or cylinder with same base and height |

Make a list of all the formulas you need to remember to find the area of a base. Talk about strategies for remembering these formulas.

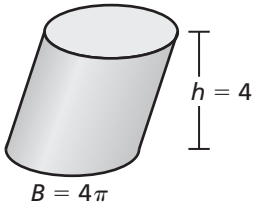
3 ACTIVITY: Volumes of Oblique Solids

Work with a partner. Think of a stack of paper. When you adjust the stack so that the sides are oblique (slanted), do you change the volume of the stack? If the volume of the stack does not change, then the formulas for volumes of right solids also apply to oblique solids.





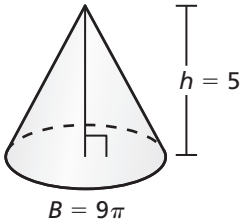
Right Cylinder



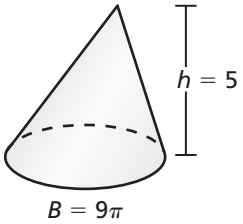
Oblique Cylinder

Name_____ Date _____

8.2 Volumes of Cones (continued)



Right Cone



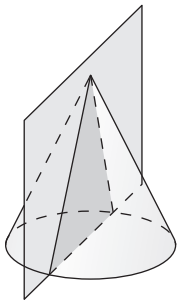
Oblique Cone

What Is Your Answer?

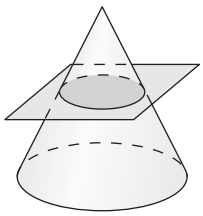
4. IN YOUR OWN WORDS How can you find the volume of a cone?

5. Describe the intersection of the plane and the cone. Then explain how to find the volume of each section of the solid.

a.



b.



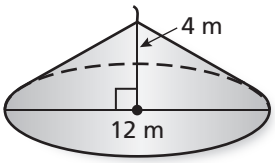
Name _____ Date _____

8.2 Practice

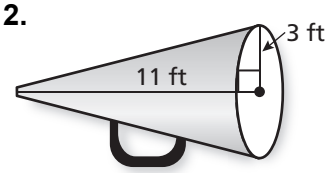
For use after Lesson 8.2

Find the volume of the cone. Round your answer to the nearest tenth.

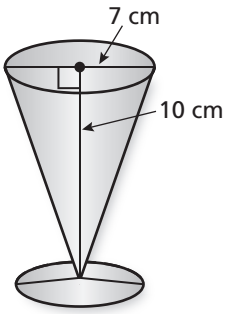
1.



2.

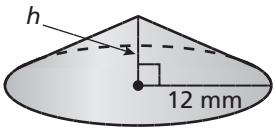


3.

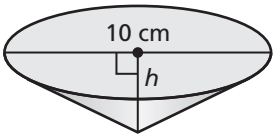


Find the missing dimension of the cone. Round your answer to the nearest tenth.

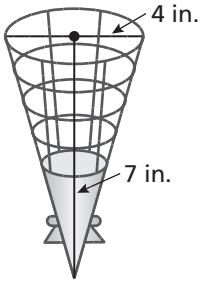
4. Volume $= 300\pi$ mm^3



5. Volume $= 78.5$ cm^3



6. What is the volume of the catch and click cone?



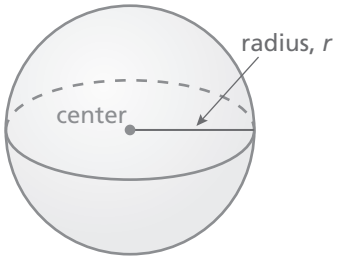
Name_____ Date _____

8.3 Volumes of Spheres

For use with Activity 8.3

Essential Question How can you find the volume of a sphere?

A **sphere** is the set of all points in space that are the same distance from a point called the *center*. The *radius r* is the distance from the center to any point on the sphere.



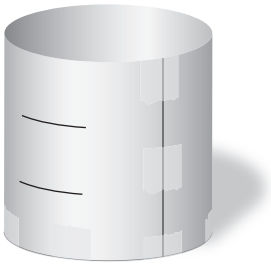
A sphere is different from the other solids you have studied so far because it does not have a base. To discover the volume of a sphere, you can use an activity similar to the one in the previous section.

1 ACTIVITY: Exploring the Volume of a Sphere

Work with a partner. Use a plastic ball similar to the one shown.

- Estimate the diameter and the radius of the ball.

- Use these measurements to draw a net for a cylinder with a diameter and a height equal to the diameter of the ball. How is the height *h* of the cylinder related to the radius *r* of the ball? Explain.



- Cut out the net. Then fold and tape it to form an open cylinder. Make two marks on the cylinder that divide it into thirds, as shown.
- Cover the ball with aluminum foil or tape. Leave one hole open. Fill the ball with rice. Then pour the rice into the cylinder. What fraction of the cylinder is filled with rice?

8.3 Volume of Spheres (continued)

2 ACTIVITY: Deriving the Formula for the Volume of a Sphere

Work with a partner. Use the results from Activity 1 and the formula for the volume of a cylinder to complete the steps.

$V = \pi r^2 h$ Write formula for volume of a cylinder.

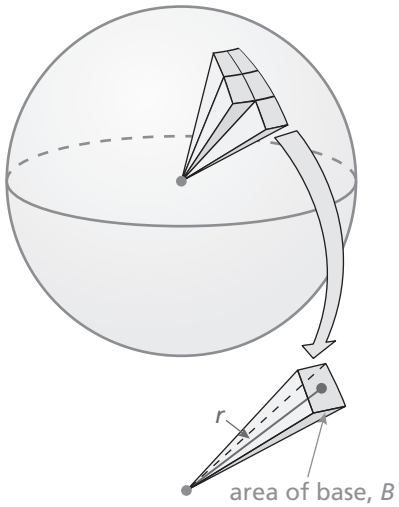
$= \frac{\square}{\square}\pi r^2 h$ Multiply by $\frac{\square}{\square}$ because the volume of a sphere is $\frac{\square}{\square}$ of the volume of the cylinder.

$= \frac{\square}{\square}\pi r^2 \square$ Substitute $\square$ for h.

$= \frac{\square}{\square}\pi \square$ Simplify.

3 ACTIVITY: Deriving the Formula for the Volume of a Sphere

Work with a partner. Imagine filling the inside of a sphere with n small pyramids. The vertex of each pyramid is at the center of the sphere and the height of each pyramid is approximately equal to r, as shown. Complete the steps. (The surface area of a sphere is equal to $4\pi r^2$.)



$V = \frac{1}{3}Bh$ Write formula for volume of a pyramid.

$= n\frac{1}{3}B\square$ Multiply by the number of small pyramids n and substitute $\square$ for h.

$= \frac{1}{3}(4\pi r^2)\square$ $4\pi r^2 \approx n \bullet \square$.

Show how this result is equal to the result in Activity 2.

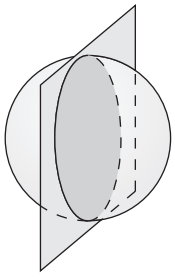
Name_____ Date _____

8.3 Volume of Spheres (continued)

What Is Your Answer?

4. IN YOUR OWN WORDS How can you find the volume of a sphere?

5. Describe the intersection of the plane and the sphere. Then explain how to find the volume of each section of the solid.



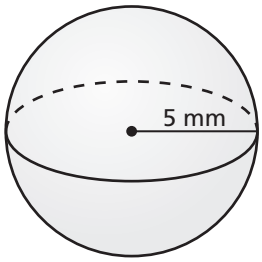
Name _____ Date _____

8.3 Practice

For use after Lesson 8.3

Find the volume of the sphere. Round your answer to the nearest tenth.

1.



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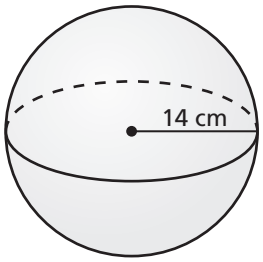

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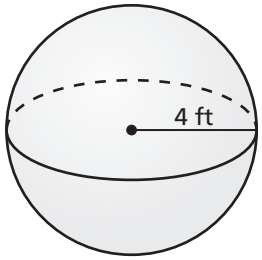
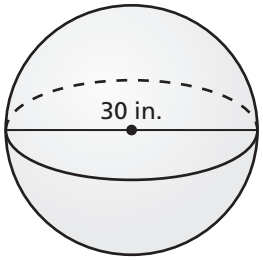
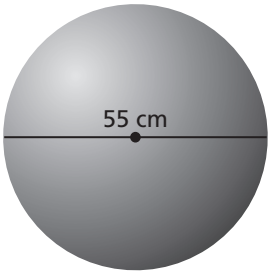


4.



5. Find the volume of the exercise ball. Round your answer to the nearest tenth.



Name_____ Date _____

8.4 Surface Areas and Volumes of Similar Solids

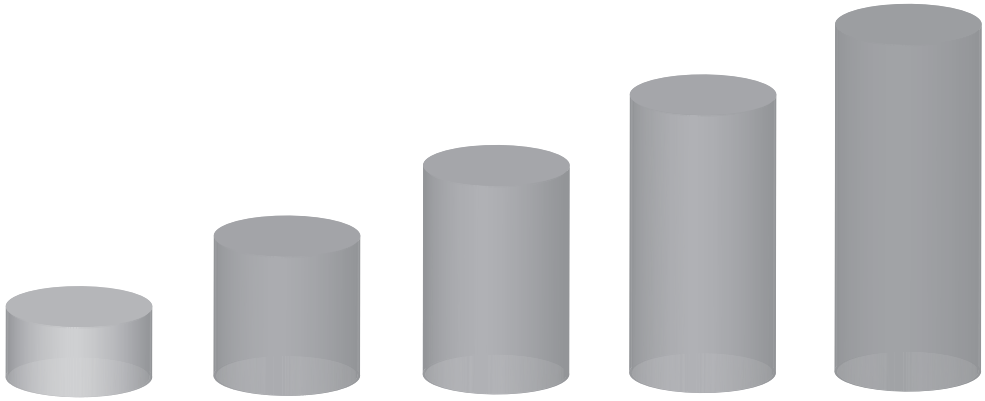
For use with Activity 8.4

Essential Question When the dimensions of a solid increase by a factor of k, how does the surface area change? How does the volume change?

1 ACTIVITY: Comparing Surface Areas and Volumes

Work with a partner. Complete the table. Describe the pattern. Are the dimensions proportional? Explain your reasoning.

a.

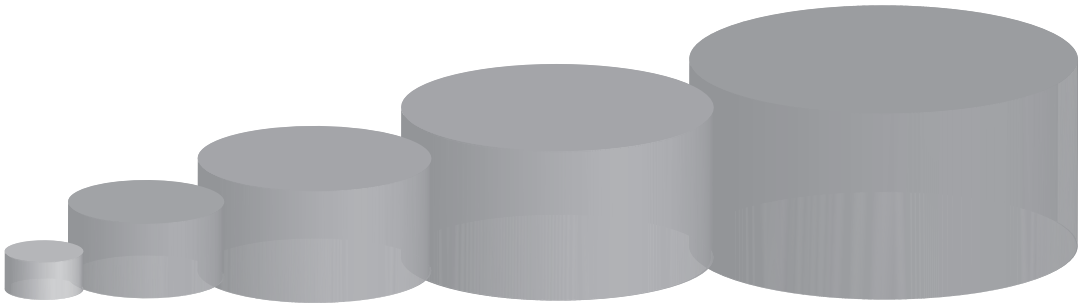


Radius	1	1	1	1	1
Height	1	2	3	4	5
Surface Area					
Volume					

Name _____ Date _____

8.4 Surface Areas and Volumes of Similar Solids (continued)

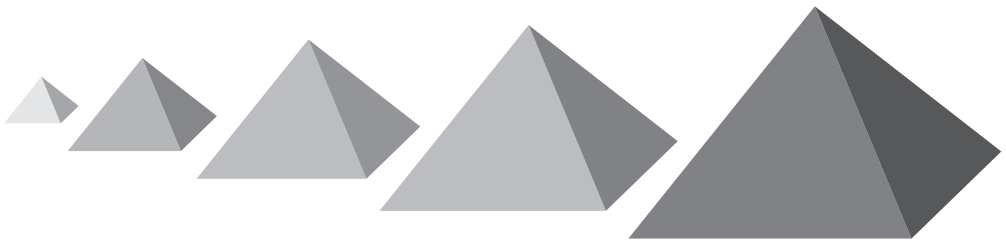
b.



Radius	1	2	3	4	5
Height	1	2	3	4	5
Surface Area					
Volume					

2 ACTIVITY: Comparing Surface Areas and Volumes

Work with a partner. Complete the table. Describe the pattern. Are the dimensions proportional? Explain.



Base Side	6	12	18	24	30
Height	4	8	12	16	20
Slant Height	5	10	15	20	25
Surface Area					
Volume					

8.4 Surface Areas and Volumes of Similar Solids (continued)

What Is Your Answer?

3. **IN YOUR OWN WORDS** When the dimensions of a solid increase by a factor of k, how does the surface area change?

4. **IN YOUR OWN WORDS** When the dimensions of a solid increase by a factor of k, how does the volume change?

5. **REPEATED REASONING** All the dimensions of a prism increase by a factor of 5.

   a. How many times greater is the surface area? Explain.

5	10	25	125

   b. How many times greater is the volume? Explain.

5	10	25	125

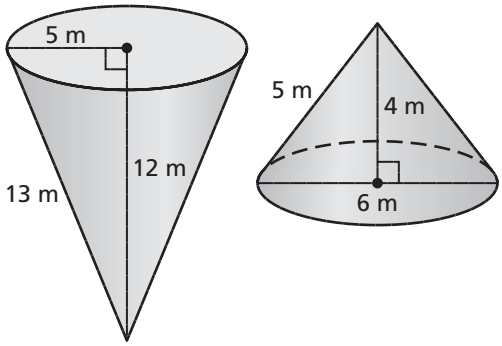
Name _____ Date _____

8.4 Practice

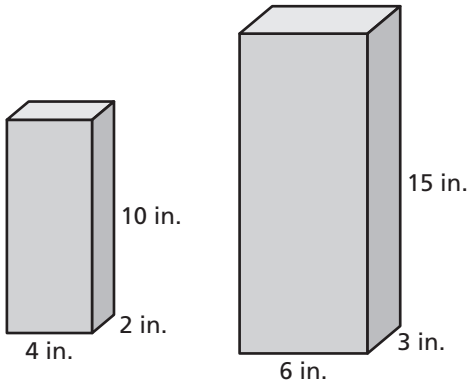
For use after Lesson 8.4

Determine whether the solids are similar.

1.

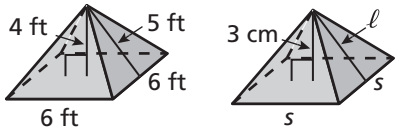


2.

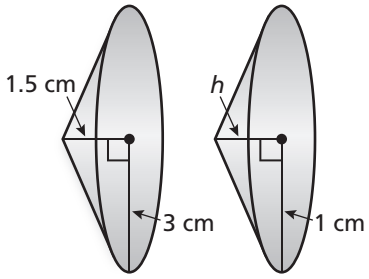


The solids are similar. Find the missing dimension(s).

3.

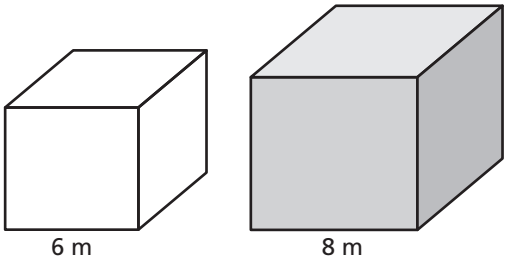


4.



The solids are similar. Find the surface area *S* or volume *V* of the shaded solid.

5.



Surface Area = 198 m^2

6.