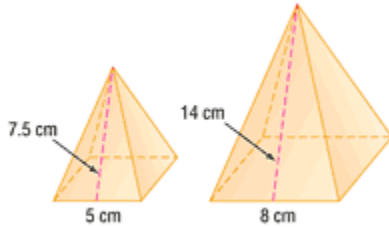


## Lesson 11-6

### Example 1 Identify Similar Solids

Determine whether each pair of solids is similar.

a.



$$\frac{5}{8} \stackrel{?}{=} \frac{7.5}{14}$$

$$5(14) \stackrel{?}{=} 8(7.5)$$

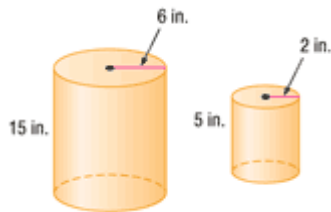
$$70 \neq 60$$

Write a proportion comparing corresponding edge lengths.

Find the cross products.  
Simplify.

The corresponding measures are not proportional, so the pyramids are not similar.

b.



$$\frac{6}{2} \stackrel{?}{=} \frac{15}{5}$$

$$6(5) \stackrel{?}{=} 15(2)$$

$$30 = 30 \checkmark$$

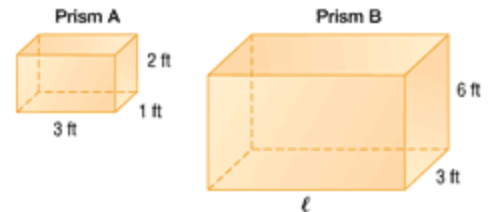
Write a proportion comparing radii and heights.

Find the cross products.  
Simplify.

The corresponding measures are proportional, so the cylinders are similar.

### Example 2 Find Missing Measures

The rectangular prisms below are similar. Find the length of prism B.



$$\frac{\text{length of prism A}}{\text{length of prism B}} = \frac{\text{width of prism A}}{\text{width of prism B}}$$

$$\frac{3}{\ell} = \frac{1}{3} \quad \text{Substitute the known values.}$$

$$3(3) = 1(\ell) \quad \text{Find the cross products.}$$

$$9 = \ell \quad \text{Simplify.}$$

The length of prism B is 9 feet.

**Example 3 Use Similar Solids to Solve a Problem**

**ARCHITECTURE** A scale model of a new office building is built on a scale of 1 foot to 40 feet. The scale model has a volume of 225 cubic feet. What is the volume of the actual building?

**Explore** You know the scale factor  $\frac{a}{b}$  is  $\frac{1}{40}$  and the volume of the model building is 225 ft<sup>3</sup>.

**Plan** Since the volumes have a ratio of  $\frac{a^3}{b^3}$  and  $\frac{a}{b} = \frac{1}{40}$ , replace  $a$  with 1 and  $b$  with 40 in  $\frac{a^3}{b^3}$ .

**Solve**

$$\frac{\text{volume of model}}{\text{volume of building}} = \frac{a^3}{b^3} \quad \text{Write the ratio of volumes.}$$
$$= \frac{1^3}{40^3} \quad \text{Replace } a \text{ with 1 and } b \text{ with 40.}$$
$$= \frac{1}{64000} \quad \text{Simplify.}$$

So, the volume of the actual building is 64000 times the volume of the model.

$$64000 \cdot 225 = 14,400,000 \text{ ft}^3$$

**Examine** Use estimation to check the reasonableness of this answer.  $64000 \cdot 200 = 12,800,000$  and  $64000 \cdot 300 = 19,200,000$ , so the answer must be between 12,800,000 and 19,200,000. The answer 14,400,000 ft<sup>3</sup> is reasonable.