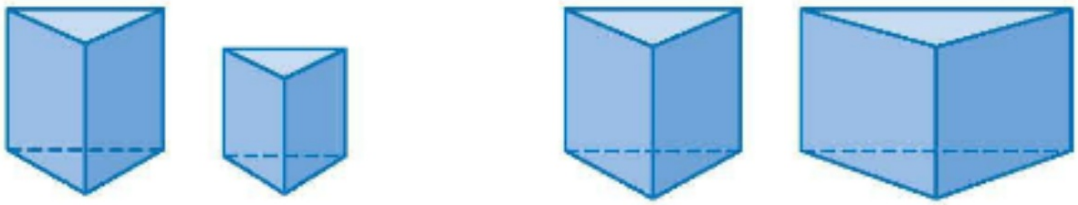
Quiz 12.5-12.6 Mon.

Geometry 12.8
Identify congruent or similar solids
Use properties of similar solids

Congruent $\cong$
Similar $\sim$
Scale factor ratio



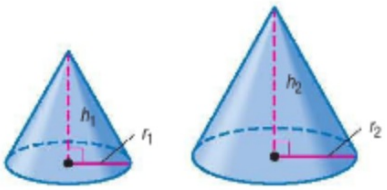

dreamstime.com
ID 167332457 © Marielemerle157

KeyConcept Similar Solids

Words

Two solids are similar if they have the same shape and the ratios of their corresponding linear measures are equal.

Models



$$\frac{h_1}{h_2} = \frac{r_1}{r_2}$$

All spheres are similar. (Why?)
All cubes are similar. (Why?)

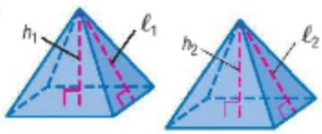
KeyConcept Congruent Solids

Words

Two solids are congruent if they have the following characteristics.

- Corresponding angles are congruent.
- Corresponding edges are congruent.
- Corresponding faces are congruent.
- Volumes are equal.

Models



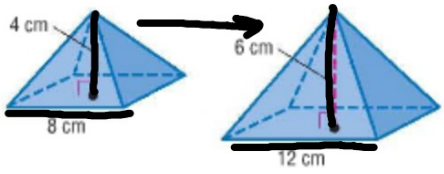
$$\frac{h_1}{h_2} = \frac{\ell_1}{\ell_2} = 1$$

SF > 1 enl. SF = 1 ≅

SF < 1 red.

Example 1 Identify Similar and Congruent Solids

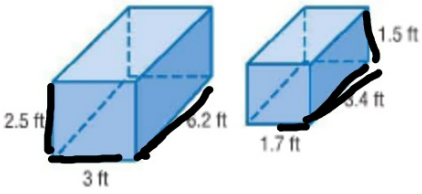
Determine whether each pair of solids is *similar*, *congruent*, or *neither*. If the solids are similar, state the scale factor.



$\frac{4}{6}$ $\left(\frac{6}{9}\right)$

yes

SF = $\frac{3}{2}$



no

$\frac{3}{1.7}$ $\frac{6.2}{3.4}$ $\frac{2.5}{1.5}$

1.76 1.8

Example 1 Identify Similar and Congruent Solids

Determine whether each pair of solids is *similar*, *congruent*, or *neither*. If the solids are similar, state the scale factor.

$\cong$

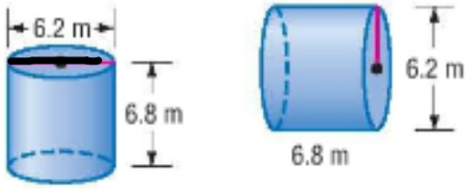
$\frac{S}{L} = \frac{12}{14.4}$ SF

yes

(L/S)

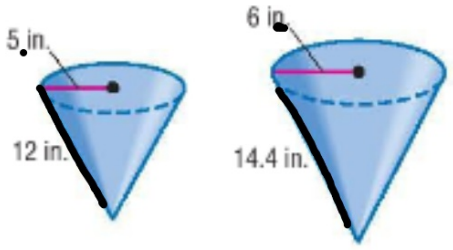
GuidedPractice

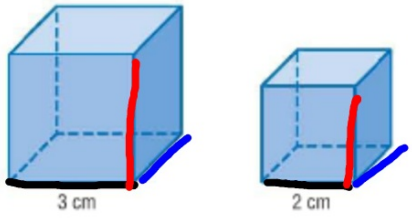
1A.



$\frac{6.2}{6.2}$ $\frac{6.8}{6.8}$

1B.





SF · SF · SF

SF	3 : 2	
	9 : 4	
$(SF)^2$ SA	54	24
	27	8
$(SF)^3$ Vol	27	8

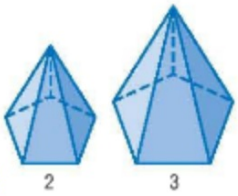
$\frac{9}{4} = \frac{54}{24}$

$216 = 216$

Theorem 12.1

Words	If two similar solids have a scale factor of $a:b$, then the surface areas have a ratio of $a^2:b^2$, and the volumes have a ratio of $a^3:b^3$.	
Examples	scale factor	2:3
	ratio of surface area	4:9
	ratio of volumes	8:27

Models



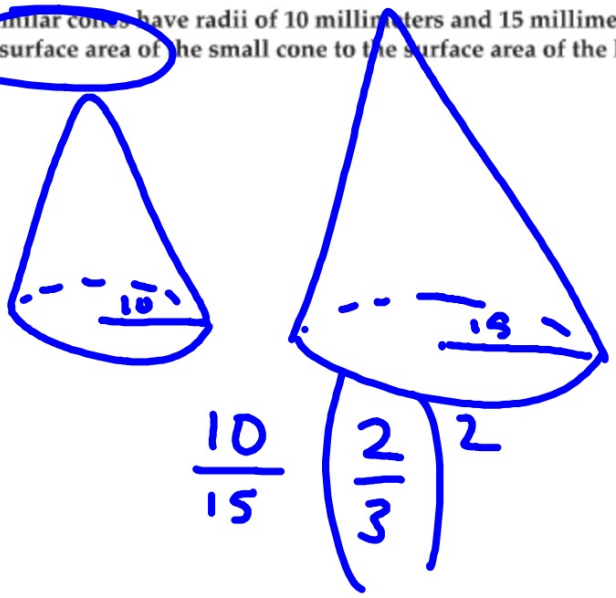
SF

4 9

8 27

Example 2 Use Similar Solids to Write Ratios

Two similar cones have radii of 10 millimeters and 15 millimeters. What is the ratio of the surface area of the small cone to the surface area of the large cone?

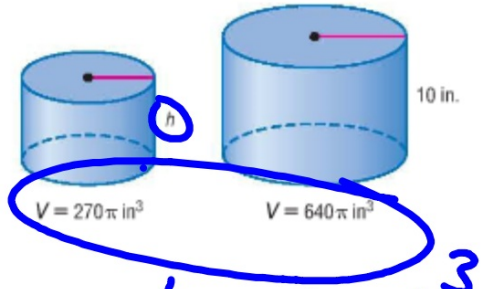


$\frac{10}{15}$ $\frac{2}{3}$

4 : 9

$\frac{4}{9}$

The cylinders are similar.



h=?

$\frac{3}{4} = \frac{h}{10}$

$\frac{4h}{4} \cdot \frac{30}{4}$

Ratio of vol. = $(SF)^3$

$\frac{270\pi}{640\pi} = \left(\frac{27}{64}\right)^3$

$SF = \frac{3}{4}$

Find SF

$h = 7.5$

Answer the question

12.8 7-47.