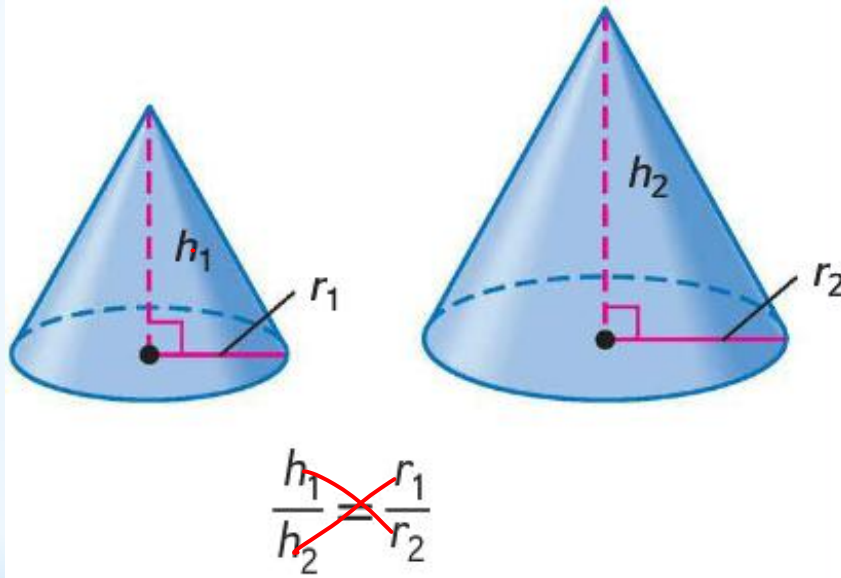


* Congruent and Similar Solids

* Similar solids have exactly the same shape but not necessarily the same size. All spheres and all cubes are similar.

* **Similar Solids**

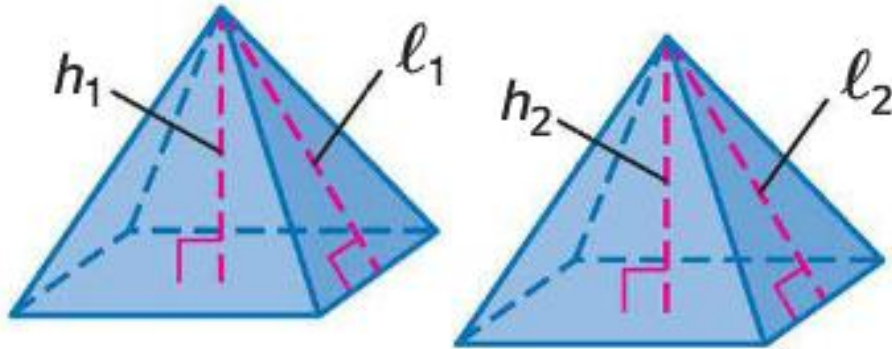
- * Two solids are similar if they have the same shape and the ratios of their corresponding linear measures are equal.



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

* Similar Solids

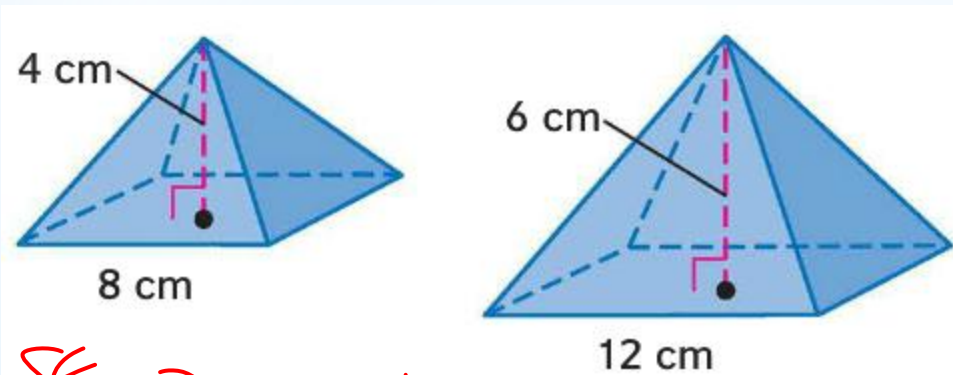
- * Congruent solids have exactly the same shape and size. Congruent solids are solids that have a scale factor of 1:1.



$$\frac{h_1}{h_2} = \frac{l_1}{l_2} = 1$$

* Congruent Solids

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



$\frac{24}{36} = \frac{8}{12}$

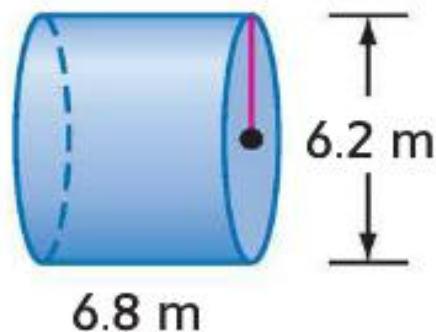
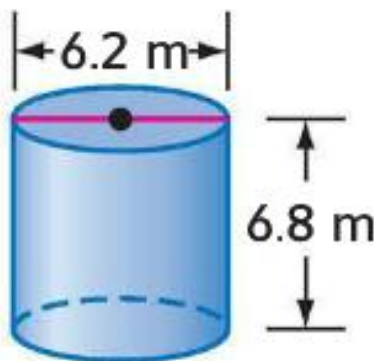
$\frac{14}{28} = \frac{6}{12}$

$\frac{4}{6} = \frac{2}{3}$

$\frac{2}{3}$

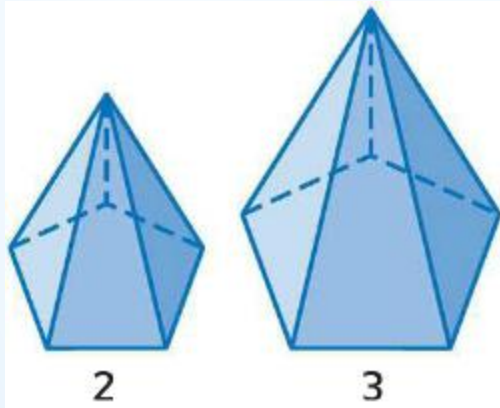
* Examples

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



* **Examples**

* 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 $a^3:b^3$.



scale factor
ratio of surface area
ratio of volumes

2:3

4:9

8:27

2^2 3^2
 2^3 3^3

* Theorem

* A regulation volleyball has a circumference of about 66 cm. The ratio of the surface area of that ball to the surface area of a children's ball is approximately 1.6:1. What is the circumference of the children's ball? Round to the nearest cm.

$$\frac{66}{x} = \frac{1.6}{1}$$

$$\frac{1.6x}{1.6} = \frac{66}{1.6}$$
$$x = 41$$

* Example