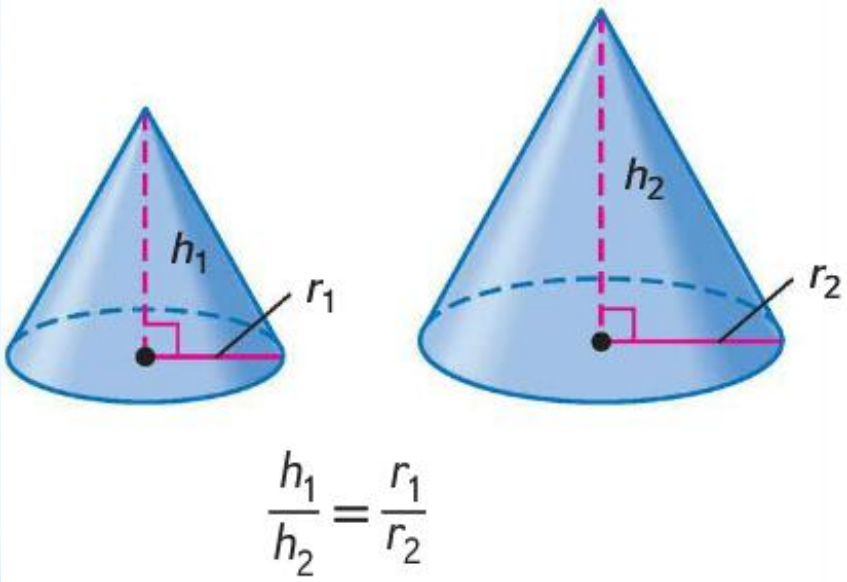
Congruent and Similar Solids

Similar Solids

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

*Similar Solids

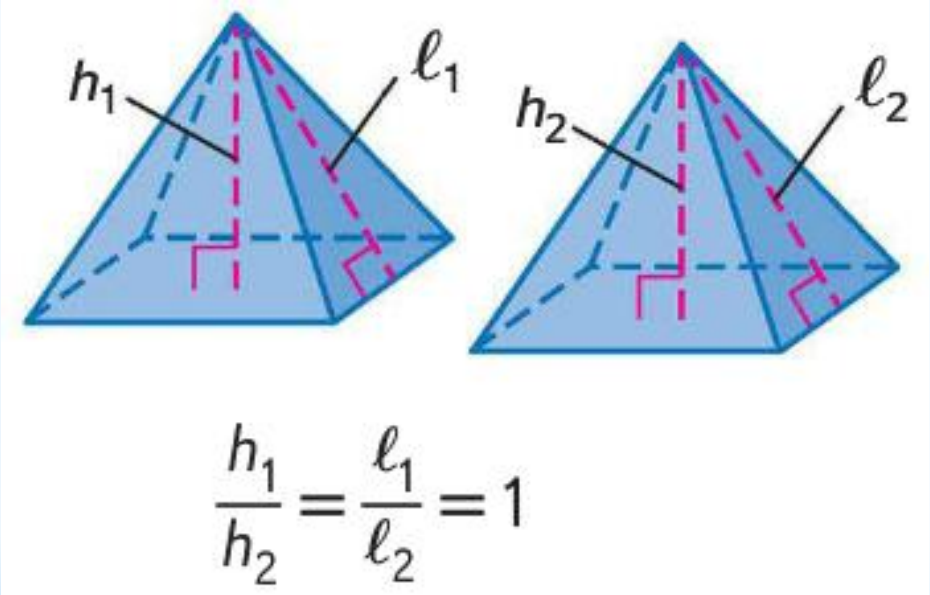
*Two solids are similar if they have the same shape and the ratios of their corresponding linear measures are equal.



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

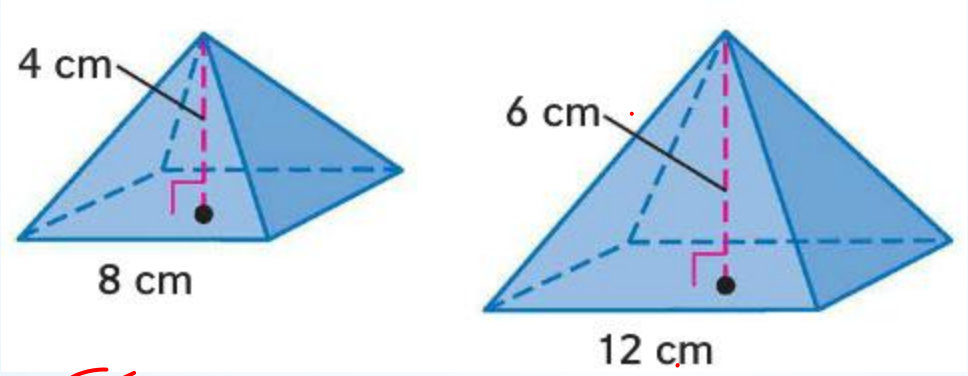
*Congruent Solids

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



*Examples

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



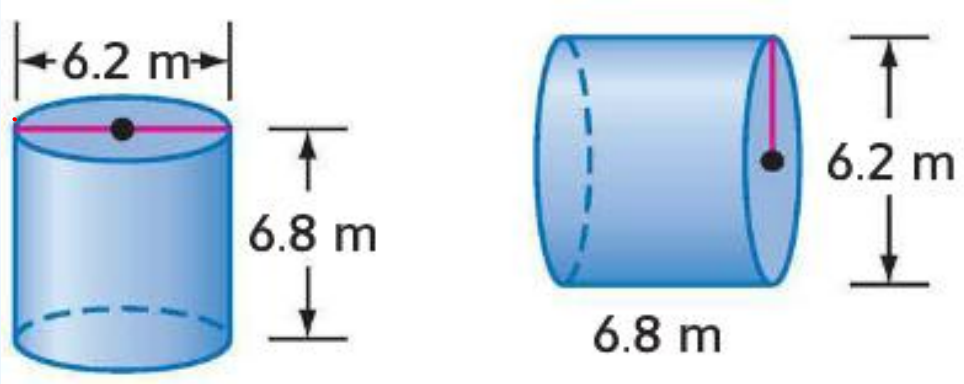
$\frac{2}{3}\frac{4}{6} = \frac{8}{12}\frac{2}{3}$ 4:6 2:3

$\frac{14}{28} = \frac{6}{12}\frac{1}{2}$ 8:12 2:3

$\frac{2}{3}$

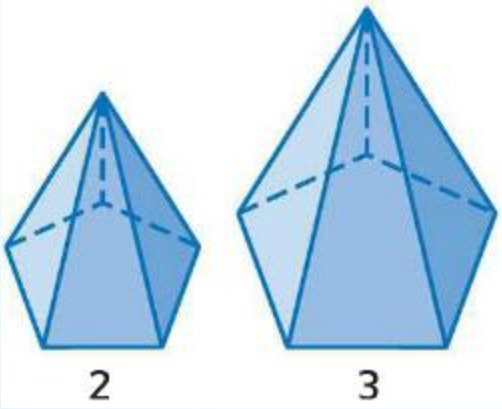
*Examples

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



*Theorem

*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	2:3
ratio of surface area	4:9
ratio of volumes	8:27

*Example

*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.

$$\frac{66}{X} \not\times \frac{1.6}{1}$$

$$\frac{66}{1.6} = \frac{1.6X}{1.6}$$

$$41 = X$$