

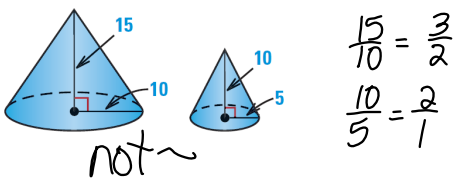
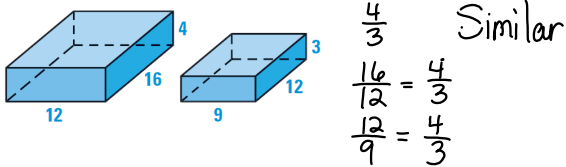
# Similar Solids

Similar solids—two solids of the same type with equal ratios of corresponding linear measures, such as heights or radii

- Scale factor—the common ratio of one solid to the other solid
- Any two cubes or any two spheres are similar.



Are the solids similar? If so, find the scale factor.



## Similar Solids Theorem

Scale factor

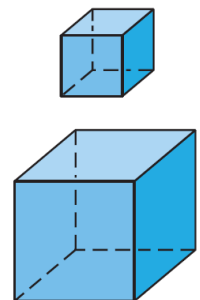
$$a : b$$

Ratio of corresponding AREAS

$$a^2 : b^2$$

Ratio of corresponding VOLUMES

$$a^3 : b^3$$



Two similar spheres have radii of 16 in. and 12 in. What is the ratio of their surface areas? What is the ratio of their volumes?

$$\begin{aligned} \text{Radii } \frac{16}{12} &= \frac{4}{3} \\ \text{SArea } \frac{4^2}{3^2} &= \frac{16}{9} \\ \text{Volume } \frac{4^3}{3^3} &= \frac{64}{27} \end{aligned}$$

The scale factor of two similar prisms is 2 to 5. If the surface area of the larger prism is  $825 \text{ cm}^2$ , what is the surface area of the smaller prism?

$$\begin{aligned} \frac{4}{25} &= \frac{x}{825} \\ x &= 132 \text{ cm}^2 \end{aligned}$$

Two similar cylinders have heights of 42 mm and 14 mm. If the volume of the smaller cylinder is  $224\pi \text{ mm}^3$ , what is the volume of the larger cylinder?

$$\begin{aligned} \frac{42}{14} &= \frac{3}{1} \\ \frac{27}{1} &= \frac{x}{224\pi} \\ x &= 6048\pi \text{ mm}^3 \end{aligned}$$

### Conclusion

1. How do you tell if two solids are similar?
2. What is the ratio of surface areas when the ratio is 2:5?  $4:25$
3. What is the ratio of the volumes using the same ratio?  $8:125$
4. Questions???

## **Assignment**

### **Similar Solids Wkst**