

Geometry

Chapter 11

Section 11-7

Apr 29-2:01 PM

Similar solids have the same shape, and all their corresponding dimensions are proportional. The ratio of corresponding linear dimensions of two similar solids is the scale factor. Any two cubes are similar, as are any two spheres.

***All corresponding faces are also similar*

Theorem 11-12 Areas and Volumes of Similar Solids

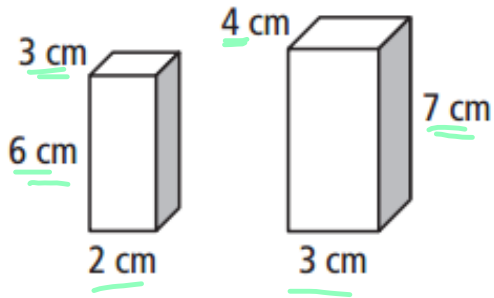
If the scale factor of two similar solids is $a : b$, then

- the ratio of their corresponding areas is $a^2 : b^2$
- the ratio of their volumes is $a^3 : b^3$

Apr 29-5:56 PM

Determine if the figures are similar.

If so, write the scale factor and ratios of corresponding areas and volume.



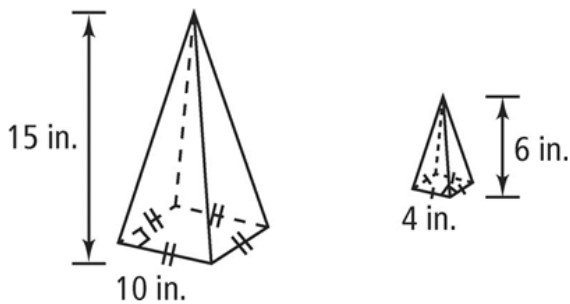
$$\frac{2}{3} \stackrel{?}{=} \frac{3}{4} \stackrel{?}{=} \frac{6}{7}$$

Not Similar.

Apr 29-6:12 PM

Determine if the figures are similar.

If so, write the scale factor and ratios of corresponding areas and volume.



$$\begin{aligned} \div 2 \quad \frac{10}{4} &\stackrel{?}{=} \frac{15}{6} \div 3 \\ \div 2 \quad \frac{10}{4} &= \frac{15}{6} \div 3 \end{aligned}$$

$$\frac{5}{2} = \frac{5}{2}$$

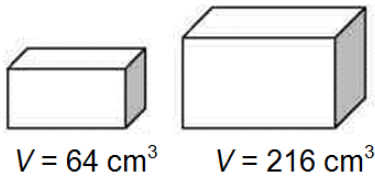
scale
 $\frac{5}{2}$

areas
 $\frac{25}{4}$

volume
 $\frac{125}{8}$

Apr 29-6:12 PM

The pair of figures is similar. Determine the scale factor and the ratio of the surface areas.



Ratio of Volumes

$$\frac{64}{216} \rightarrow \frac{32}{108} \rightarrow \frac{16}{54} \rightarrow \frac{8}{27}$$

Scale

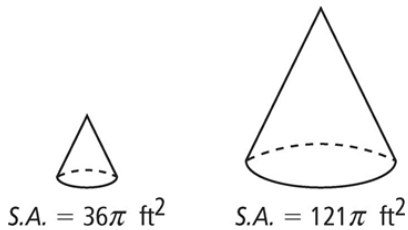
$$\sqrt[3]{\frac{8}{27}} = \frac{2}{3}$$

Ratio of areas

$$\frac{4}{9}$$

Apr 29-7:02 PM

The pair of figures is similar. Determine the scale factor and the ratio of the volumes.



$$\frac{36\pi}{121\pi} = \frac{36}{121}$$

Scale

$$* \sqrt{\frac{36}{121}} = \frac{6}{11}$$

Volume

$$\frac{6^3}{11^3} = \frac{216}{1331}$$

Apr 29-7:02 PM

The surface areas of two similar cylinders are $50\pi \text{ mm}^2$ and $98\pi \text{ mm}^2$. If the volume of the larger cylinder is $68.6\pi \text{ mm}^3$ find the volume* of the smaller cylinder. **in terms of pi*

$$\frac{\text{area}}{50\pi} = \frac{25}{98\pi} = \frac{25}{49}$$

$$\frac{\text{Scale}}{5} = \frac{7}{7}$$

$$\frac{\text{Volume}}{*125} = \frac{X}{68.6\pi}$$

$$\frac{68.6\pi \cdot 125}{343} = \frac{343X}{343}$$

$$25\pi \text{ mm}^3$$

Apr 29-7:32 PM

The volumes of two similar pyramids are 25 in^3 and 40 in^3 . What is the scale factor of the pyramids?

$$\frac{\text{Volume}}{25} = \frac{40}{8}$$

$$\frac{\text{Scale}}{\sqrt[3]{5}} = \frac{\sqrt[3]{11}}{2}$$

$$\begin{array}{r} \sqrt[3]{8} \\ 2 \end{array}$$

$$2$$

Apr 29-7:32 PM

A stadium is giving away replica baseball bats that are five-eighths the length of a regulation bat which has a volume of about 103 cubic inches. If the replica and original are similar solids, estimate the volume of the replica bat to the nearest cubic inch.

Scale

$$\frac{5}{8}$$

Volume

$$\frac{125}{512} = \frac{x}{103}$$

$$\frac{512x}{512} = \frac{125 \cdot 103}{512}$$

$$x \approx 25 \text{ in}^3$$

Apr 29-7:52 PM

Homework

Pages 746 - 747

6 - 24 even

Apr 29-2:01 PM