Warm Up

Find the surface area and volume of each solid.

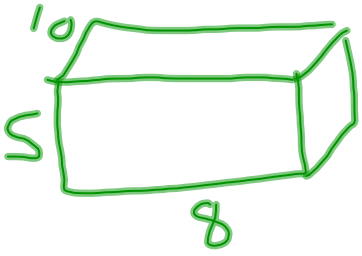
1. Sphere with radius 7.3 ft

$S.A. = 4\pi r^2$

$4\pi \cdot 7.3^2$

$V = \frac{4}{3}\pi r^3$ $\frac{4\cdot\pi\cdot 7.3^3}{3}$

2. Right rectangular prism with side lengths 8 in, 5 in, and 10 in



$S.A. = 10\cdot 8 + 10\cdot 8 + 5\cdot 8 + 5\cdot 8 + 5\cdot 10 + 5\cdot 10$

$V = l\cdot w\cdot h = 10\cdot 5\cdot 8$

12-7 Similar Solids

Sides of similar solids have a ratio of $\frac{a}{b}$

Surface areas of similar solids have a ratio of $\frac{a^2}{b^2}$

Volumes of similar solids have a ratio of $\frac{a^3}{b^3}$

Ex 1 Two balls are similar with a scale factor of 7:6. The larger ball has a surface area of 249.55 in^2 and a volume of 371.61 in^3. Find the surface area and volume of the smaller ball.

$\frac{7^2}{6^2} = \frac{249.55}{x}$ 183.34 in^2

$\frac{7^3}{6^3} = \frac{371.61}{y}$ 234.01 in^3

Ex 2 Two prisms are similar with a scale factor of 2:3. The smaller prism has a surface area of 40 in^2 and a volume of 60 in^3. Find the surface area and volume of the larger prism.

S.A.: $\frac{2^2}{3^2} = \frac{40}{x}$ 90 in^2

V.: $\frac{2^3}{3^3} = \frac{60}{y}$ 202.5 in^3

Ex 3 Two cones are similar. One cone has a volume of 125 m³. The other cone has a volume of 512 m³. Find the scale factor of the first cone to the second cone.

$$\frac{a^3}{b^3} = \frac{125}{512}$$

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

Ex. 4 Two pyramids are similar. The first pyramid has a volume of 1000 in³ and the second pyramid has a volume of 216 in³. Find the scale factor of the first to the second pyramid.

$$\frac{a^3}{b^3} = \frac{1000}{216}$$

$$\frac{a}{b} = \boxed{\frac{10}{6}} \quad \boxed{\frac{5}{3}}$$