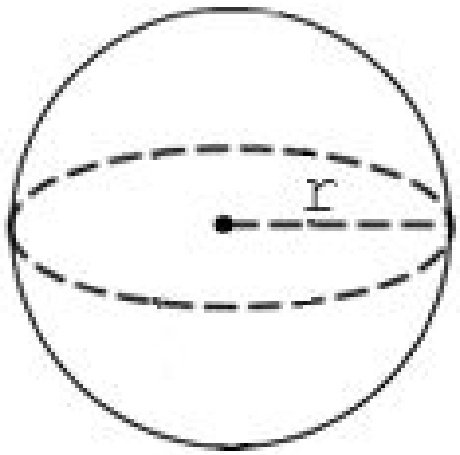
Surface Area of a Sphere

Surface area of a sphere is:

$S = 4\pi r^2$



r - radius

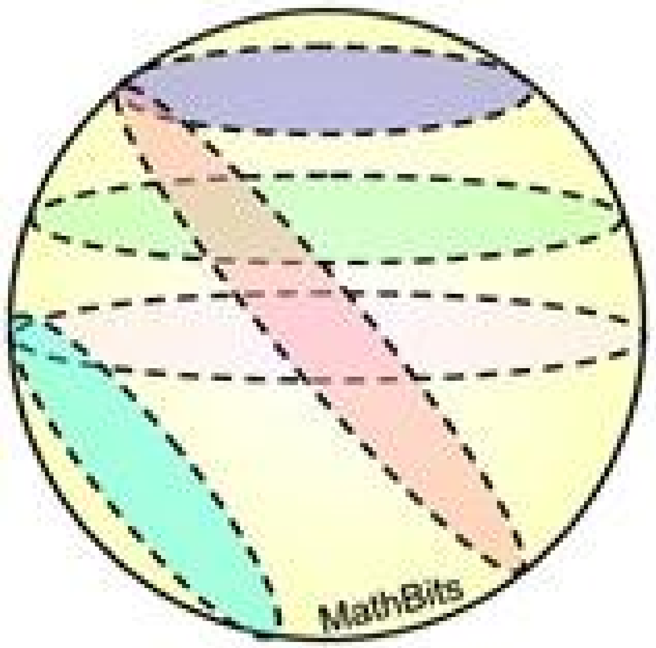
Cross Sections of a Sphere:

Any cross section of a sphere will be a circle *or* a single point.

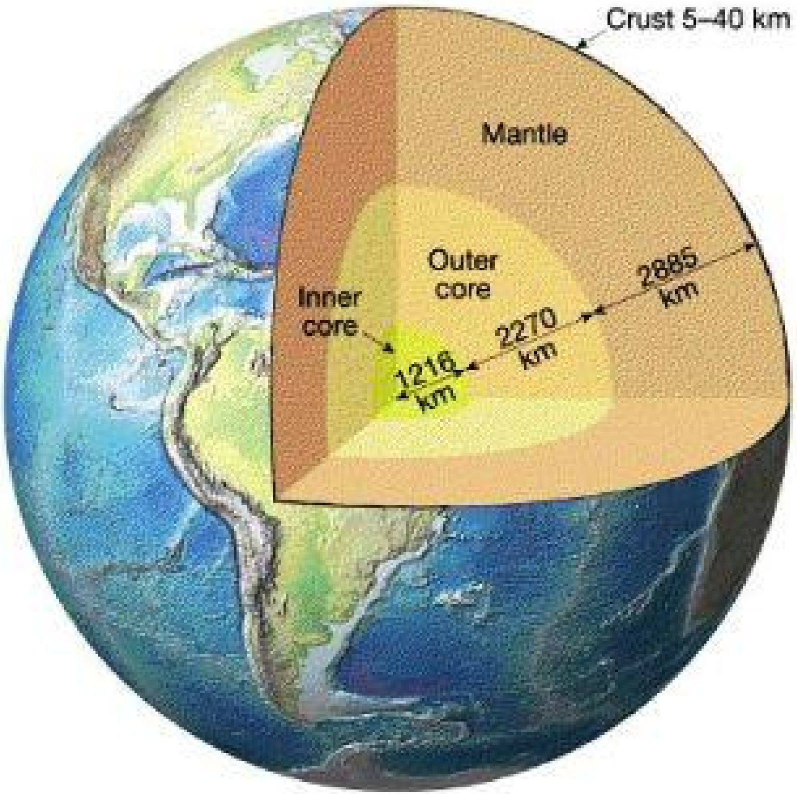
A cross section that contains the center of the sphere creates a ***great circle***.

A *great circle's* circumference is the circumference of the sphere.

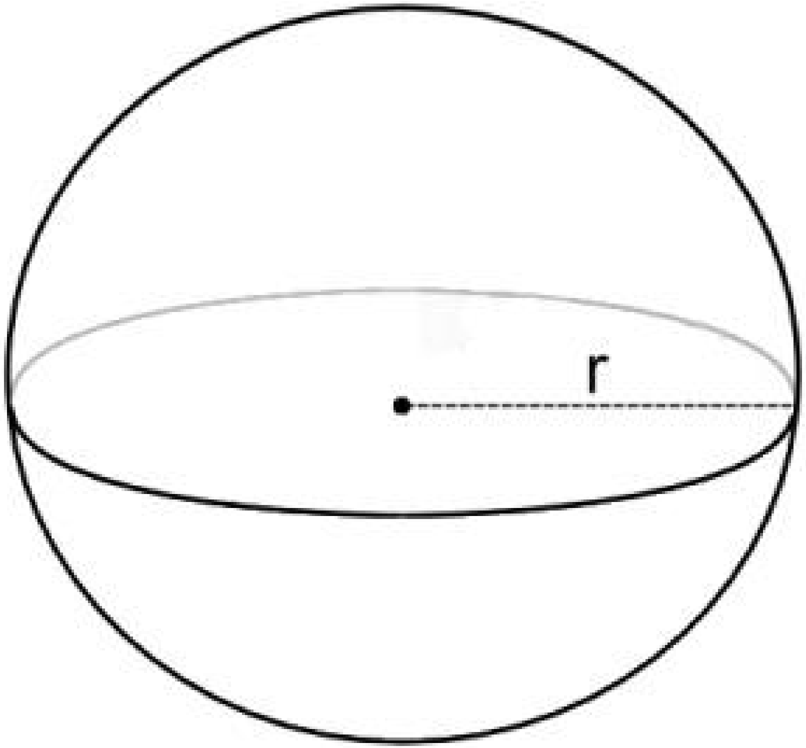
A *great circle* will always cut the sphere in exactly 2 congruent hemispheres.



The radius of the Earth from the inner core to the mantle is about 6,371 km. What is the approximate surface area of the Earth?



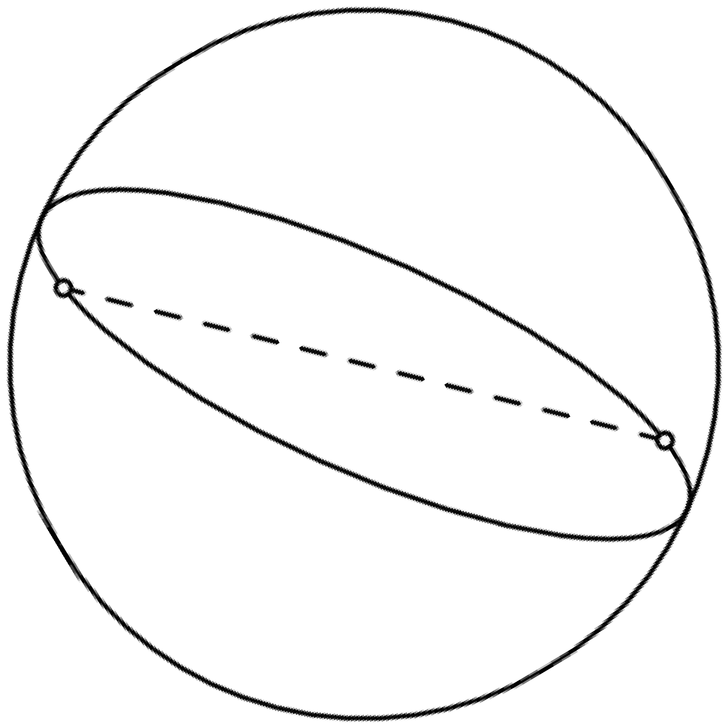
The surface area of this sphere is 40.96π in^2. What is its radius?



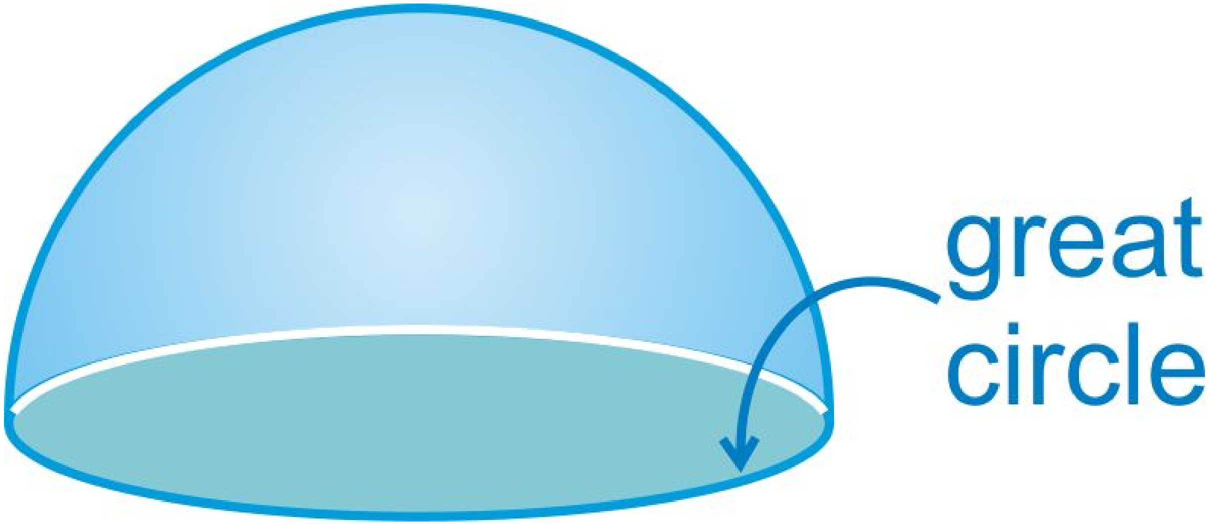
This circle is a great circle of this sphere.

The surface area of the region above the circle is 50π.

What is the radius of the sphere?



The surface area of the figure is 363π in^2. What is the surface area of the sphere that contains that great circle?



Volume of Spheres

Volume of a sphere can be thought of as the composition of many pyramids where the base of the pyramid is on the surface of the sphere and the vertex is at the center of the sphere.

Then the height of the pyramid would be the radius of the sphere, and the composition of all of the bases of the pyramids would be equal to the surface area of a sphere. So we have the formula: $V = \frac{1}{3}(4\pi r^2)r$

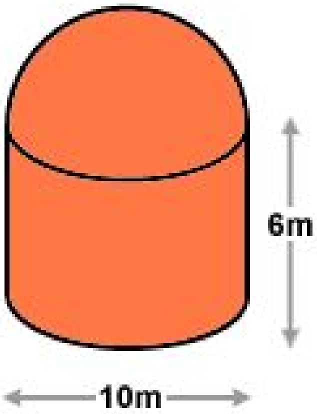
If we condense this we have the formula: $V = (4/3)\pi r^3$

So the formula for the volume of a sphere is: $V = (4/3)\pi r^3$

Find the volume

1. A beach ball has a diameter of 15 inches. What is its volume?

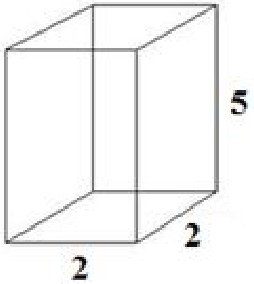
2. Find the volume of the composite figure:

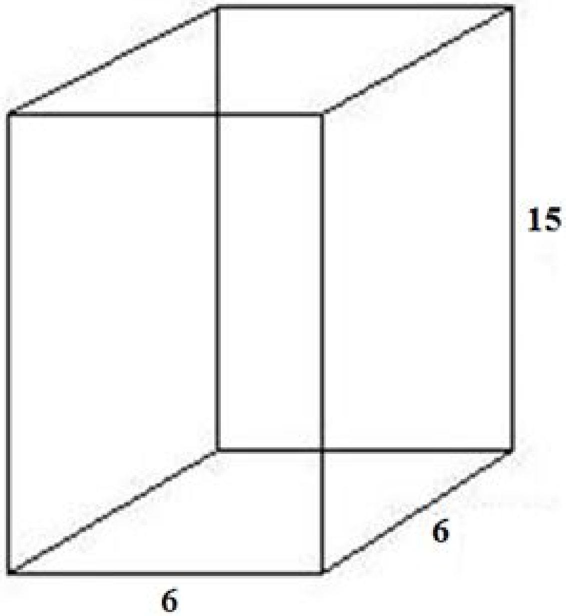


Similar Solids

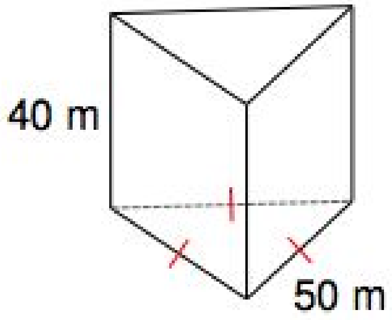
Two solids with equal ratios of corresponding linear measures.

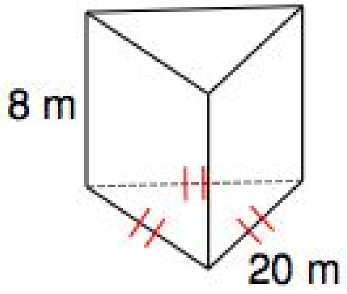
The common ratio between two solids is called the *scale factor*.

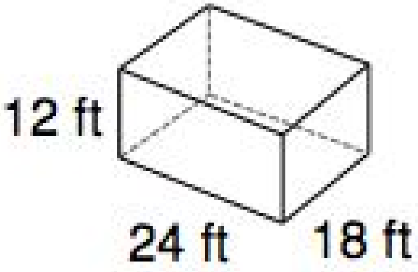


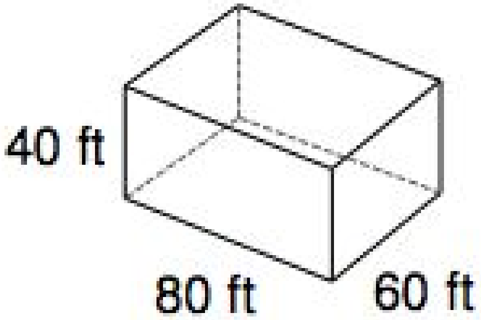


Determine if these figures are similar:



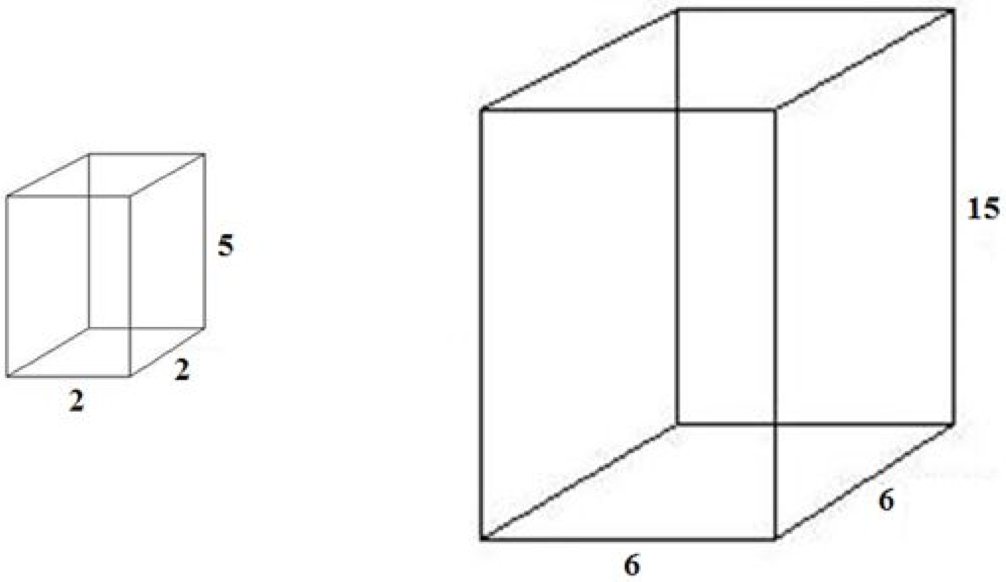




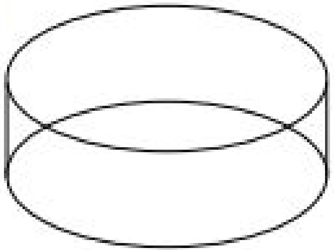


Similar Solids Theorem

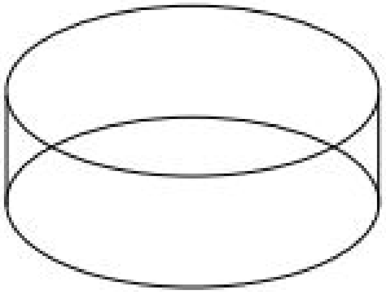
If two similar solids have a scale factor of $a{:}b$, then corresponding areas have a ratio of $a^2{:}b^2$, and corresponding volumes have a ratio of $a^3{:}b^3$.



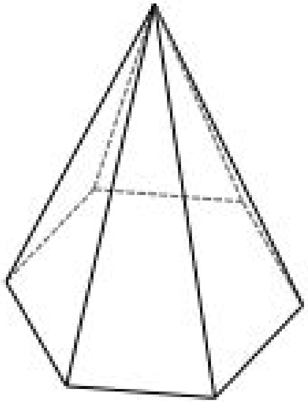
Find the Scale Factor between these similar figures:



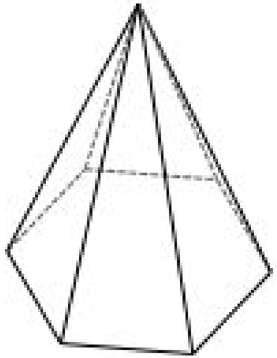
SA: 81 in^2



SA: 169 in^2



V: 343 in^3



V: 1331 in^3