

Volume Problems

Common formulas for volume

Volume of a prism or cylinder: $V = A_b h$

Volume of a sphere: $V = \frac{4}{3} \pi r^3$

Volume of a pyramid or cone: $V = \frac{1}{3} A_b h$

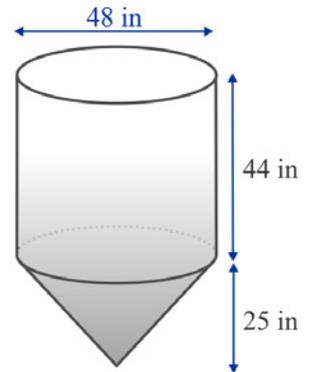
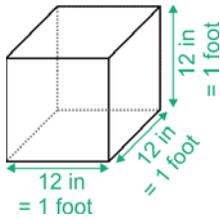
You may use a calculator in all problems in this lesson.

1. Memorize the above formulas.

Hint: notice how the formula for the volume of a sphere is similar to the formula for the area of a circle. The area of a circle is “pi r squared.” The formula for volume has “pi r cubed”, and then it is multiplied by the fraction $4/3$.

2. A large tank consisting of a cylindrical top and a conical bottom (for easy drainage) is being filled with biodiesel at a rate of 2 cubic feet per minute. How long will it take to fill it?

The diagram below will help you figure out how many cubic inches are in one cubic foot.



3. Many objects are in the shape of a **frustum**, or a cut cone. It is like a cone from which a smaller cone is cut off. There exists a formula for its volume, but you can calculate the volume without it, if you know the dimensions of the “cut” part. (Think subtraction.)

a. Find the volume of the frustum on the right, to the nearest hundred cubic centimeters.

b. Convert that to liters (1 L = 1,000 cm³).

