

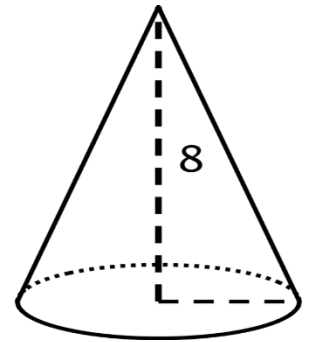
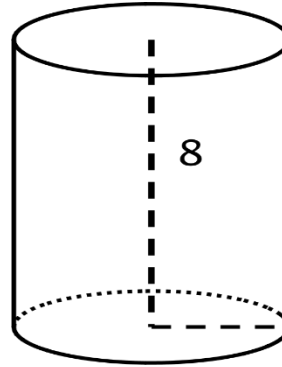
Unit 5, Lesson 15: The Volume of a Cone

15.1: Which Has a Larger Volume?

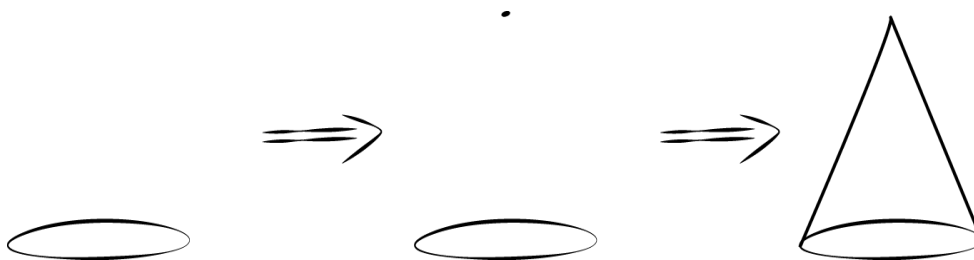
The cone and cylinder have the same height, and the radius of their bases are equal.

1. Which figure do you think has a larger volume?

2. Do you think the volume of the smaller one is more or less than $\frac{1}{2}$ the volume of the larger one? Explain your reasoning.



3. Here is a method for quickly sketching a cone:



- Draw an oval.
- Draw a point centered above the oval.
- Connect the edges of the oval to the point.
- Which parts of your drawing would be hidden behind the object? Make these parts dashed lines.

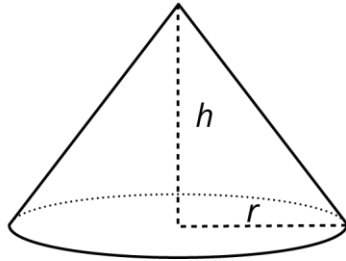
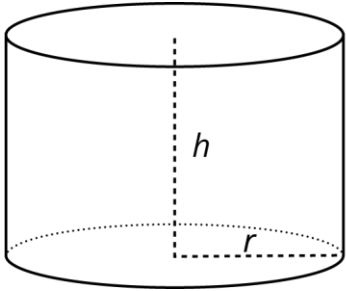
Sketch three different sized cones. The oval doesn't have to be on the bottom! For each drawing, label the cone's **radius** with r and **height** with h .

15.2: From Cylinders to Cones

A cone and cylinder have the same height and their bases are congruent circles.

1. If the volume of the cylinder is 90 cm^3 , what is the volume of the cone?

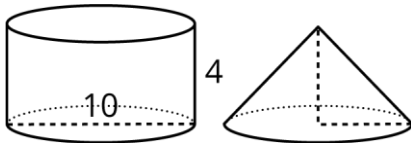
2. If the volume of the cone is 120 cm^3 , what is the volume of the cylinder?



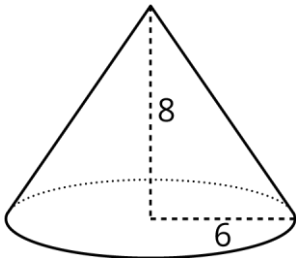
3. If the volume of the cylinder is $V = \pi r^2 h$, what is the volume of the cone? Either write an expression for the cone or explain the relationship in words.

4. Here is a cylinder and cone that have the same height and the same base area.

What is the volume of each figure? Express your answers in terms of π .



5. Here is a cone.



a) What is the area of the base? Express your answer in terms of π .

b) What is the volume of the cone? Express your answer in terms of π .

6. A cone-shaped popcorn cup has a radius of 5 centimeters and a height of 9 centimeters. How many cubic centimeters of popcorn can the cup hold? Use 3.14 as an approximation for π , and give a numerical answer.

