

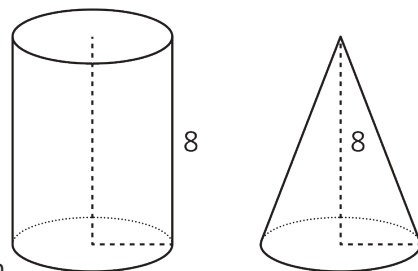
Unit 5 Lesson 15: The Volume of a Cone

1 Which Has a Larger Volume? (Warm up)

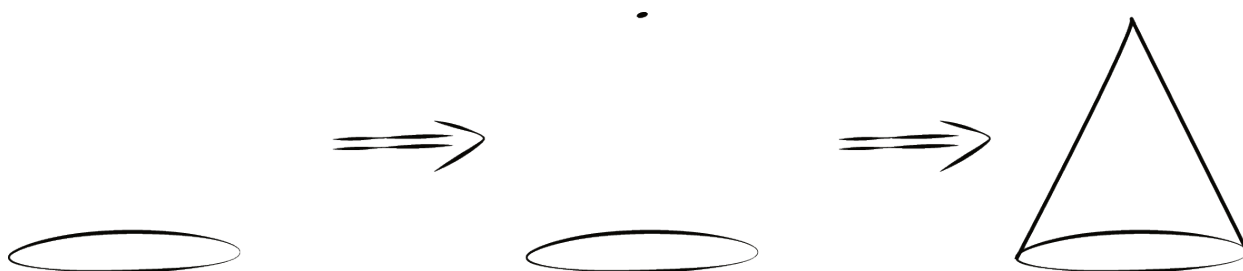
Student Task Statement

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

1. Which figure 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. Sketch two 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 .

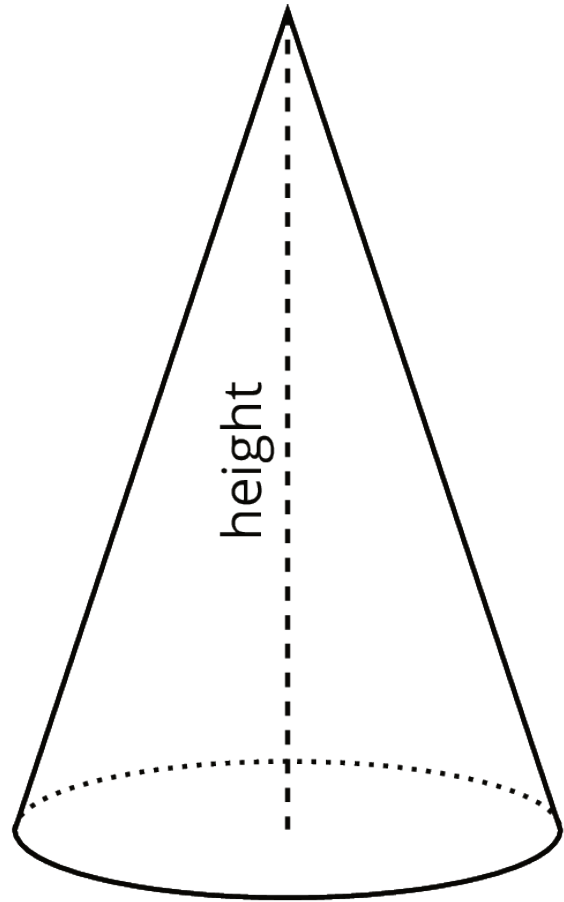
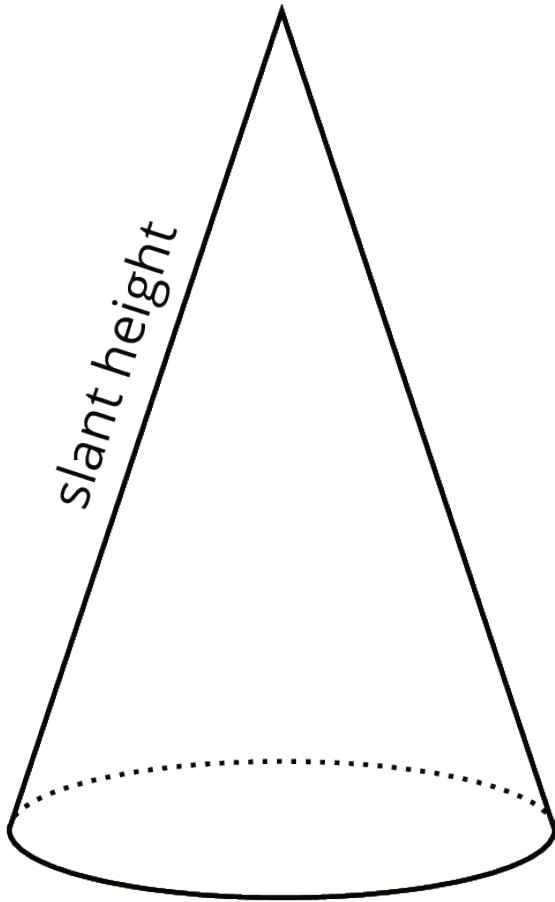


Here is a method for quickly sketching a cone:



- 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.

Activity Synthesis

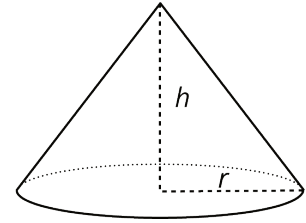
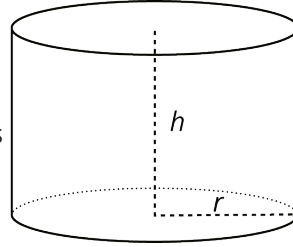


2 From Cylinders to Cones

Student Task Statement

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.

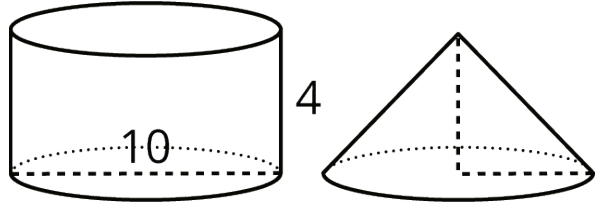


3 Calculate That Cone

Student Task Statement

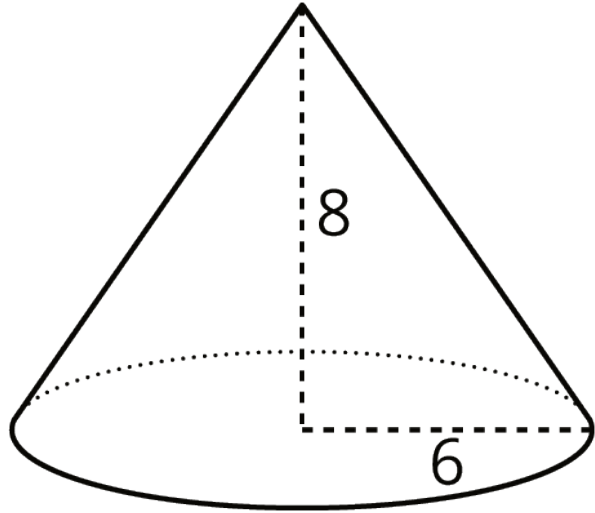
1. Here is a cylinder and cone that have the same height and the same base area.

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



2. 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 .



3. 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.