NAME_____

Module 13 **Perimeter, Area, and Volume**
Lesson 7 **Volume: Pyramids and Cones**

Lesson Notes 13.7

Lesson Objectives

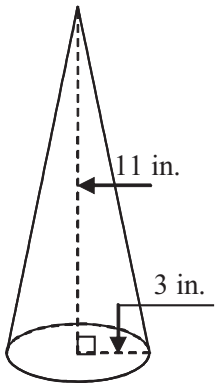
- Derive and use formulas for volume of pyramids and cones and justify using geometric models and common materials.
- Use cubic units to find the volume of pyramids and cones.
- Demonstrate understanding of when to use linear units to describe perimeter, square units to describe area or surface and cubic units to describe volume, in real-world situations.
- Compare and contrast the differences among linear units, square units, and cubic units.

Subtopic 1 Volume of a Cone

Volume of a Cone

$$V = \frac{1}{3}\pi r^2 h$$

1 Find the volume.



$$V = \frac{1}{3}\pi r^2 h$$
$$= \frac{1}{3} \times 3.14 \times (3 \text{ in.})^2 \times 11 \text{ in.}$$
$$\approx 103.62 \text{ in.}^3$$

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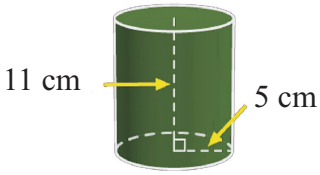
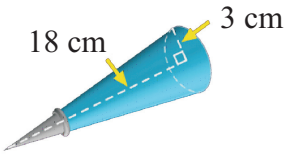
2 A cone shaped icing bag has a radius of three centimeters and a height of 18 centimeters. How many times will this can of icing fill the bag? The can is a cylinder with a radius of five centimeters and a height of 11 centimeters.





Volume of cylinder:

$V = \pi r^2 h$

$V = 3.14 \times (5\text{ cm})^2 \times 11\text{ cm}$

$V \approx 863.5\text{ cm}^3$

Volume of cone:

$V = \frac{1}{3}\pi r^2 h$

$V = \frac{1}{3} \times 3.14 \times (3\text{ cm})^2 \times 18\text{ cm}$

$V \approx 169.56\text{ cm}^3$

$N = (863.5\text{ cm}^3) \div (169.56\text{ cm}^3)$

$N = 5.09$

The can will fill the bag 5 times.

Subtopic 2 Volume of a Pyramid

Volume of a Pyramid

$V = \frac{1}{3}Bh$

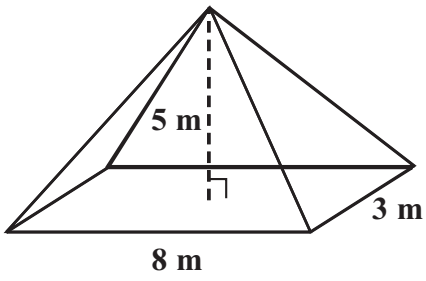
3 Find the volume.

$V = \frac{1}{3}Bh$

$= \frac{1}{3}(8\text{ m} \times 3\text{ m})5\text{ m}$

$= \frac{1}{3}(24\text{ m}^2) \times 5\text{ m}$

$= 40\text{ m}^3$



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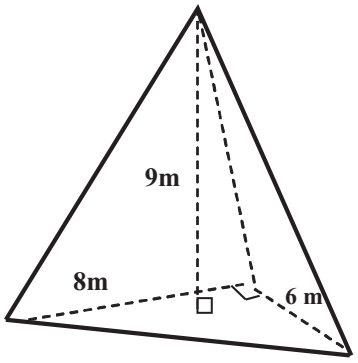
4 Find the volume.

$$V = \frac{1}{3}Bh$$
$$= \frac{1}{3}\left(\frac{1}{2} \times 6\,\text{m} \times 8\,\text{m}\right)h$$
$$= \frac{1}{3} \times 24\ \text{m}^2 \times h$$
$$= \frac{1}{3} \times 24\ \text{m}^2 \times 9\ \text{m}$$
$$= 72\ \text{m}^3$$



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