Sec 1.5 Volume of Right Pyramids and Right Cones

Volume

↳ the amount of space an object occupies, measured in cubic units.

Recall from Grade 8

Volume of any prism = $Area\ of\ the\ Base \times Height$

= $B \times H$

↓

this changes depending on the shape of the prism

Rectangular Prism

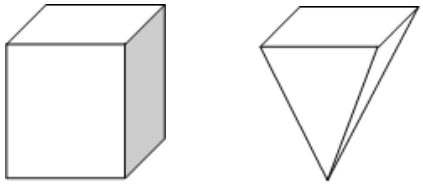
Cylinder

Complete Investigation 1.5

Investigation 1.5: Volumes of Right Pyramids and Right Cones

Part A:

The right prism and a right pyramid given has equal bases and equal heights.



1. What is the formula for the volume for a right rectangular prism?

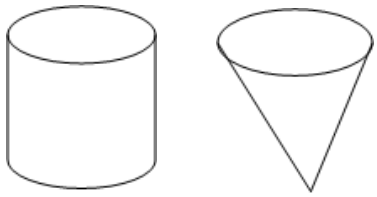
2. Fill the pyramid with water, without overfilling! Pour the water from the pyramid into the prism. How many full pyramids fill the prism? Take a guess first!

3. What conclusion can you make about the relationship between the volumes of a right prism and a right pyramid with equal bases and equal heights?

4. What is the formula for the **volume** of a right rectangular **pyramid**?

Part B:

The right cylinder and a right cone given has equal bases and equal heights.



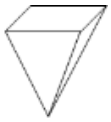
1. What is the formula for the volume for a right cylinder?

2. Fill the cone with water, without overfilling! Pour the water from the cone into the cylinder. How many full cones fill the cylinder? Take a guess first!

3. What conclusion can you make about the relationship between the volumes of a right cylinder and a right cone with equal bases and equal heights?

4. What is the formula for the **volume** of a right **cone**?

Summary after Investigation

Volume of a right rectangular pyramid 

Volume of a right cone 

Note:

This relationship between right prisms and right pyramids is true for any shaped base, as long as they have the same base and height.

Example 1

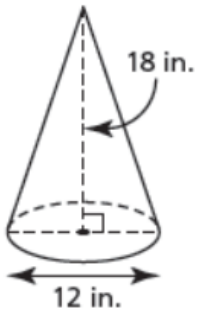
Determine the volume of a right rectangular pyramid with base dimensions 5.4 cm by 3.2 cm and height 8.1 cm. Round the answer to the nearest tenth of a cubic centimeter.

Example 2

A cylinder has volume of 312 cm^3. What is the volume of a cone that has the same base and height as the cylinder?

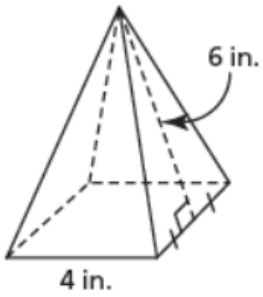
Example 3

Determine the volume of this cone to the nearest cubic inch.



Example 4

Calculate the volume of this right square pyramid to the nearest cubic inch.



Example 5

A cone has a height of 4 yd. and a volume of 205 yd^3. Determine the radius of the base of the cone to the nearest yard.

Work Book Questions	Extra Practice Questions
p.42 #4a, 5a, 6a, 7a, 8b, 9b, 10ab, 11ab, 12, 18abcd	p.42 #4b, 5b, 6b, 7b, 8a, 9a, 13b, 14ac, 19b