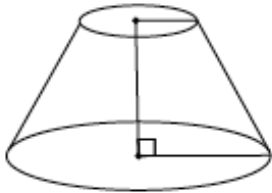


### Lesson Summary

A truncated cone or pyramid is the solid obtained by removing the top portion of a cone or a pyramid above a plane parallel to its base. Shown below on the left is a truncated cone. A truncated cone with the top portion still attached is shown below on the right.

Truncated cone:



Truncated cone with top portion attached:



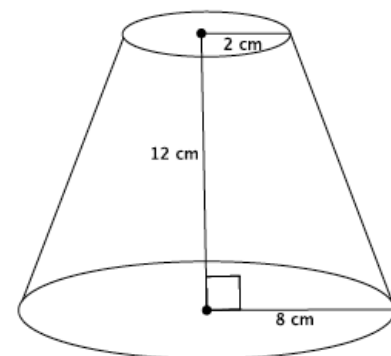
To determine the volume of a truncated cone, you must first determine the height of the portion of the cone that has been removed using ratios that represent the corresponding sides of the right triangles. Next, determine the volume of the portion of the cone that has been removed and the volume of the truncated cone with the top portion attached. Finally, subtract the volume of the cone that represents the portion that has been removed from the complete cone. The difference represents the volume of the truncated cone.

Pictorially,

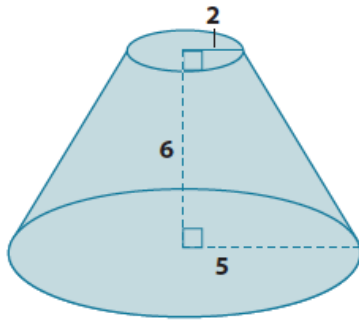


### Problem Set

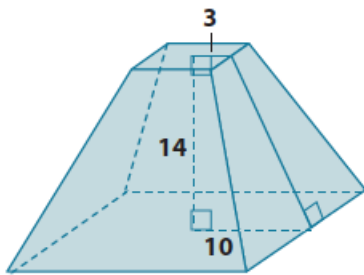
1. Find the volume of the truncated cone.
  - a. Write a proportion that will allow you to determine the height of the cone that has been removed. Explain what each part of the proportion represents.
  - b. Solve your proportion to determine the height of the cone that has been removed.
  - c. Show a fact about the volume of the truncated cone using an expression. Explain what each part of the expression represents.
  - d. Calculate the volume of the truncated cone.



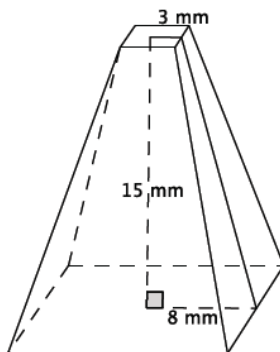
2. Find the volume of the truncated cone.



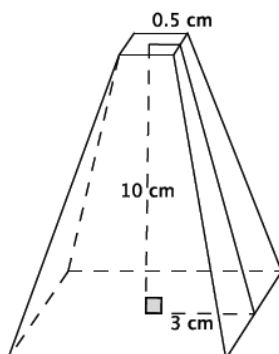
3. Find the volume of the truncated pyramid with a square base.



4. Find the volume of the truncated pyramid with a square base. Note: 3 mm is the distance from the center to the edge of the square at the top of the figure.



5. Find the volume of the truncated pyramid with a square base. Note: 0.5 cm is the distance from the center to the edge of the square at the top of the figure.



6. Explain how to find the volume of a truncated cone.
7. Challenge: Find the volume of the truncated cone.

