11-3 Volume: Pyramids and Cones *(Pages 568–572)*

When you find the volume of a pyramid or cone, you must know the height h.
The height is *not* the same as the lateral height, which you learned in an
earlier lesson. The height h of a pyramid or cone is the length of a segment
from the vertex to the base, perpendicular to the base.

Volume of a Pyramid	If a pyramid has a base of B square units, and a height of h units, then the volume V is $\frac{1}{3} \cdot B \cdot h$ cubic units, or $V = \frac{1}{3}Bh$.
Volume of a Cone	If a cone has a radius of r units and a height of h units, then the volume V is $\frac{1}{3} \cdot \pi \cdot r^2 \cdot h$ cubic units, or $V = \frac{1}{3}\pi r^2 h$.

Examples   Find the volume of the given figures.

a. a square pyramid with a base side length of 6 cm and a height of 15 cm

$V = \frac{1}{3}Bh$ *Formula for the volume of a pyramid*

$V = \frac{1}{3}s^2h$ *Replace B with s^2.*

$V = \frac{1}{3}(6)^2(15)$ or 180 cm³

b. a cone with a radius of 3 in. and a height of 8 in.

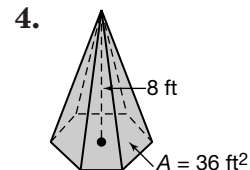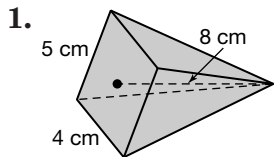$V = \frac{1}{3}\pi r^2h$ *Formula for the volume of a cone*

$V = \frac{1}{3}\pi(3)^2(8)$ *$r = 3$ and $h = 8$*

$V = \frac{1}{3}\pi(9)(8)$ or about 75.4 in³

Practice

Find the volume of each solid. Round to the nearest tenth.

1.

5 cm   8 cm   4 cm

2.

50 mm   40 mm

3.

21 in.   18 in.

4.

8 ft $A = 36$ ft²
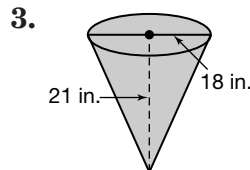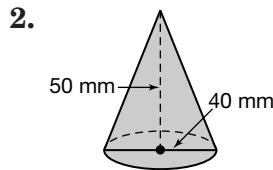
5. **Cooking**   A spice jar is 3 inches tall and 1.5 inches in diameter. A funnel
   is 2 inches tall and 2.5 inches in diameter. If Hayden fills the funnel with
   pepper to put into the spice jar, will it overflow?

6. | Standardized Test Practice | A square pyramid is 6 feet tall and with the
   sides of the base 8 feet long. What is the volume of the pyramid?

   A 96 ft³   **B** 128 ft³   **C** 192 ft³   **D** 384 ft³