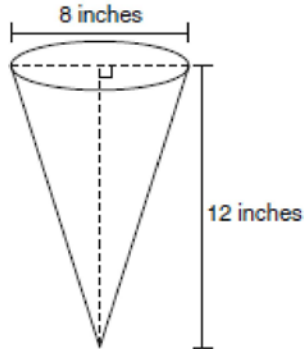


**G.GMD.A.3: Volume 5**

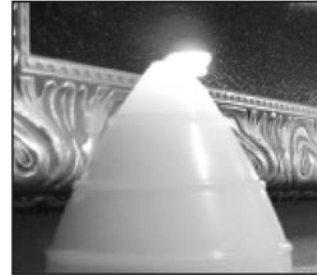
- 1 In the diagram below, a right circular cone has a diameter of 8 inches and a height of 12 inches.



What is the volume of the cone to the *nearest cubic inch*?

- 1) 201
  - 2) 481
  - 3) 603
  - 4) 804
- 2 A right circular cone has a diameter of  $10\sqrt{2}$  and a height of 12. What is the volume of the cone in terms of  $\pi$ ?
- 1)  $200\pi$
  - 2)  $600\pi$
  - 3)  $800\pi$
  - 4)  $2400\pi$
- 3 A water cup in the shape of a cone has a height of 4 inches and a maximum diameter of 3 inches. What is the volume of the water in the cup, to the *nearest tenth of a cubic inch*, when the cup is filled to half its height?
- 1) 1.2
  - 2) 3.5
  - 3) 4.7
  - 4) 14.1

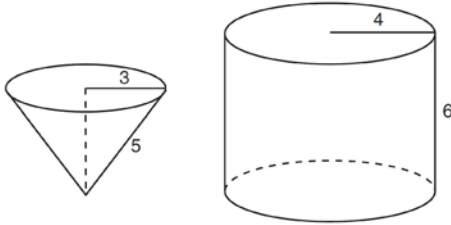
- 4 A candle maker uses a mold to make candles like the one shown below.



The height of the candle is 13 cm and the circumference of the candle at its widest measure is 31.416 cm. Use modeling to approximate how much wax, to the *nearest cubic centimeter*, is needed to make this candle. Justify your answer.

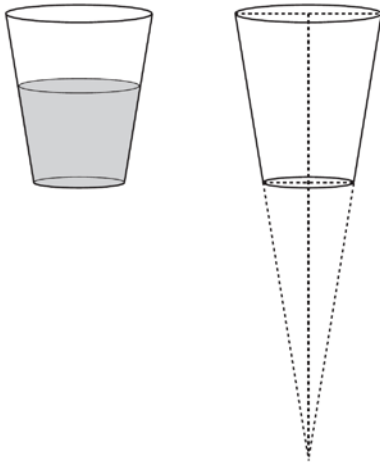
- 5 A paper container in the shape of a right circular cone has a radius of 3 inches and a height of 8 inches. Determine and state the number of cubic inches in the volume of the cone, in terms of  $\pi$ .

- 6 In the diagram below, a right circular cone with a radius of 3 inches has a slant height of 5 inches, and a right cylinder with a radius of 4 inches has a height of 6 inches.



Determine and state the number of full cones of water needed to completely fill the cylinder with water.

- 7 A water glass can be modeled by a truncated right cone (a cone which is cut parallel to its base) as shown below.



The diameter of the top of the glass is 3 inches, the diameter at the bottom of the glass is 2 inches, and the height of the glass is 5 inches. The base with a diameter of 2 inches must be parallel to the base with a diameter of 3 inches in order to find the height of the cone. Explain why. Determine and state, in inches, the height of the larger cone. Determine and state, to the *nearest tenth of a cubic inch*, the volume of the water glass.

### G.GMD.A.3: Volume 5

#### Answer Section

1 ANS: 1

$$V = \frac{1}{3} \pi r^2 h = \frac{1}{3} \pi \cdot 4^2 \cdot 12 \approx 201$$

REF: 060921ge

2 ANS: 1

$$V = \frac{1}{3} \pi \cdot (5\sqrt{2})^2 \cdot 12 = 200\pi$$

REF: 011623ge

3 ANS: 1

$$V = \frac{1}{3} \pi \left( \frac{1.5}{2} \right)^2 \left( \frac{4}{2} \right) \approx 1.2$$

REF: 011724geo

4 ANS:

$$C = 2\pi r \quad V = \frac{1}{3} \pi \cdot 5^2 \cdot 13 \approx 340$$

$$31.416 = 2\pi r$$

$$5 \approx r$$

REF: 011734geo

5 ANS:

$$V = \frac{1}{3} \pi (3^2)(8) = 24\pi$$

REF: 081530ge

6 ANS:

$$h = \sqrt{5^2 - 3^2} = 4 \quad V = \frac{1}{3} \pi \cdot 3^2 \cdot 4 = 12\pi \quad V = \pi \cdot 4^2 \cdot 6 = 96\pi \quad \frac{96\pi}{12\pi} = 8$$

REF: 011537ge

7 ANS:

Similar triangles are required to model and solve a proportion.  $\frac{x+5}{1.5} = \frac{x}{1} \quad \frac{1}{3} \pi (1.5)^2 (15) - \frac{1}{3} \pi (1)^2 (10) \approx 24.9$

$$x + 5 = 1.5x$$

$$5 = .5x$$

$$10 = x$$

$$10 + 5 = 15$$

REF: 061636geo