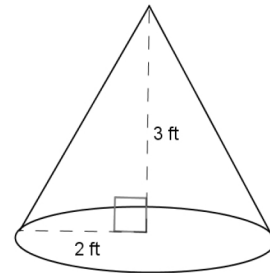
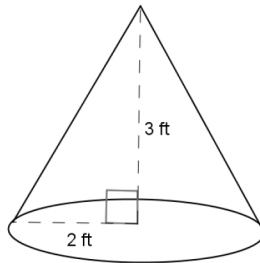
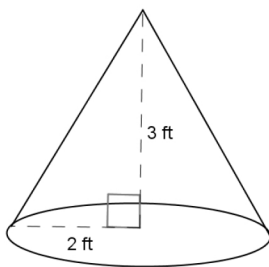


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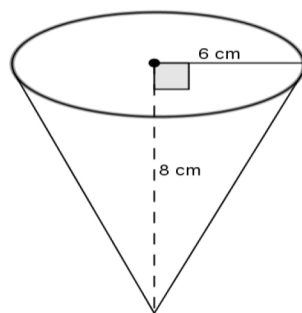
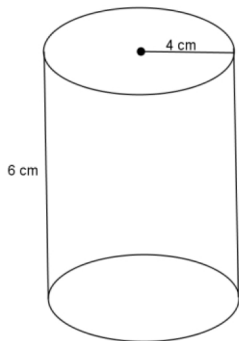
Date _____

Volumes of Familiar Solids—Cones and Cylinders

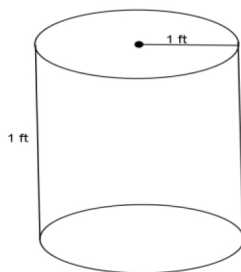
1. Use the diagram to find the total volume of the three cones shown below.



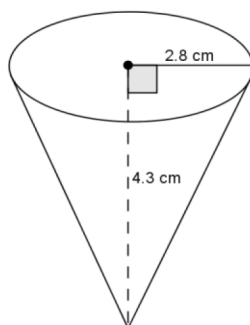
2. Use the diagram below to determine which has the greater volume, the cone or the cylinder.



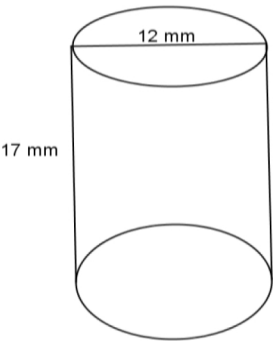
1. Use the diagram to help you find the volume of the right circular cylinder.



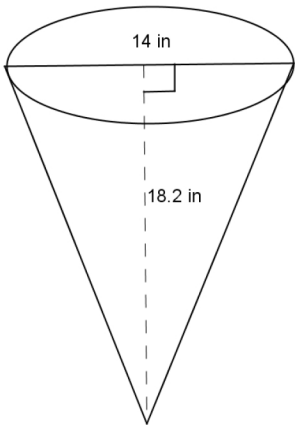
2. Use the diagram to help you find the volume of the right circular cone.



3. Use the diagram to help you find the volume of the right circular cylinder.

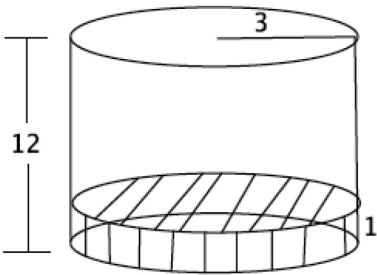


4. Use the diagram to help you find the volume of the right circular cone.

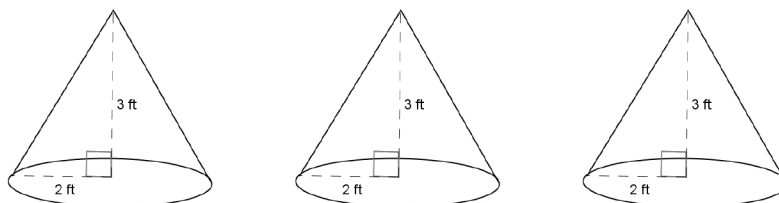


5. Oscar wants to fill with water a bucket that is the shape of a right circular cylinder. It has a 6-inch radius and 12-inch height. He uses a shovel that has the shape of right circular cone with a 3-inch radius and 4-inch height. How many shovelfuls will it take Oscar to fill the bucket up level with the top?

6. A cylindrical tank (with dimensions shown below) contains water that is 1-foot deep. If water is poured into the tank at a constant rate of $20 \frac{\text{ft}^3}{\text{min}}$ for 20 min., will the tank overflow? Use 3.14 to estimate π .



1. Use the diagram to find the total volume of the three cones shown below.



Since all three cones have the same base and height, the volume of the three cones will be the same as finding the volume of a cylinder with the same base radius and same height.

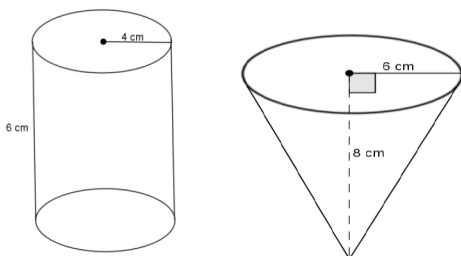
$$V = \pi r^2 h$$

$$V = \pi(2)^2 3$$

$$V = 12\pi$$

The volume of all three cones is $12\pi \text{ ft}^3$.

2. Use the diagram below to determine which has the greater volume, the cone or the cylinder.



The volume of the cylinder is

$$V = \pi r^2 h$$

$$V = \pi 4^2 6$$

$$V = 96\pi.$$

The volume of the cone is

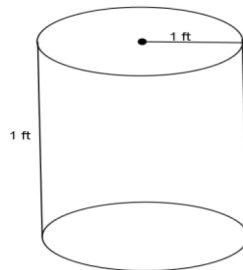
$$V = \frac{1}{3} \pi r^2 h$$

$$V = \frac{1}{3} \pi 6^2 8$$

$$V = 96\pi.$$

The volume of the cylinder and the volume of the cone are the same, $96\pi \text{ cm}^3$.

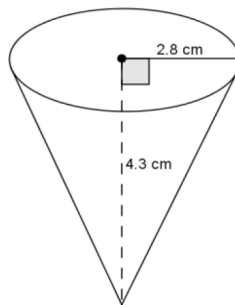
1. Use the diagram to help you find the volume of the right circular cylinder.



$$V = \pi r^2 h$$
$$V = \pi(1)^2(1)$$
$$V = \pi$$

The volume of the right circular cylinder is $\pi \text{ ft}^3$.

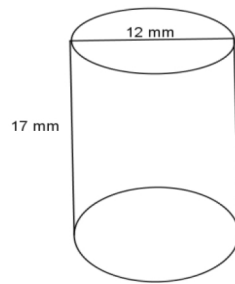
2. Use the diagram to help you find the volume of the right circular cone.



$$V = \frac{1}{3} \pi r^2 h$$
$$V = \frac{1}{3} \pi (2.8)^2 (4.3)$$
$$V = 11.237333 \dots \pi$$

The volume of the right circular cone is about $11.2\pi \text{ cm}^3$.

3. Use the diagram to help you find the volume of the right circular cylinder.



If the diameter is 12 mm, then the radius is 6 mm.

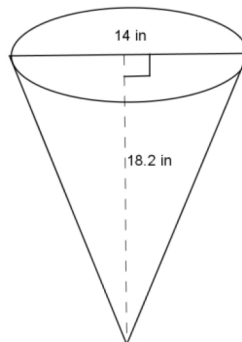
$$V = \pi r^2 h$$

$$V = \pi(6)^2(17)$$

$$V = 612\pi$$

The volume of the right circular cylinder is $612\pi \text{ mm}^3$.

4. Use the diagram to help you find the volume of the right circular cone.



If the diameter is 14 in., then the radius is 7 in.

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

$$V = \frac{1}{3}\pi(7)^2(18.2)$$

$$V = 297.26666 \dots \pi$$

The volume of the right cone is about $297.3\pi \text{ in}^3$.

5. Oscar wants to fill with water a bucket that is the shape of a right circular cylinder. It has a 6-inch radius and 12-inch height. He uses a shovel that has the shape of right circular cone with a 3-inch radius and 4-inch height. How many shovelfuls will it take Oscar to fill the bucket up level with the top?

$$V = \pi r^2 h$$

$$V = \pi(6)^2(12)$$

$$V = 432\pi$$

The volume of the bucket is $432\pi \text{ in}^3$.

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

$$V = \frac{1}{3}\pi(3)^2(4)$$

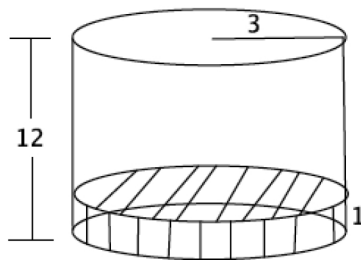
$$V = 12\pi$$

The volume of shovel is $12\pi \text{ in}^3$.

$$\frac{432\pi}{12\pi} = 36$$

It would take 36 shovelfuls of water to fill up the bucket.

6. A cylindrical tank (with dimensions shown below) contains water that is 1-foot deep. If water is poured into the tank at a constant rate of $20 \frac{\text{ft}^3}{\text{min}}$ for 20 min., will the tank overflow? Use 3.14 to estimate π .



$$V = \pi r^2 h$$

$$V = \pi(3)^2(12)$$

$$V = 108\pi$$

The volume of the tank is about 339.12 ft^3 .

$$V = \pi r^2 h$$

$$V = \pi(3)^2(1)$$

$$V = 9\pi$$

There is about 28.26 ft^3 of water already in the tank. There is about 310.86 ft^3 of space left in the tank. If the water is poured at a constant rate for 20 min., 400 ft^3 will be poured into the tank, and the tank will overflow.