

## Volume- Practice 2

1. A cylindrical tennis ball canister holds 3 tennis balls. The canister is 7 in. long with a diameter of 3 inches. The tennis balls also have a diameter of 3 inches. How many cubic inches of air is in the canister?

2. The trailer of a semi-truck is 45 ft. by 28 ft. by 28 ft. The trailer needs to transport boxes that are 4 ft. by 4 ft. by 2 ft. How many boxes can fit into the truck at one time?

3. A spherical balloon has a radius of 3 inches. If you blow up the balloon so that the radius is now 6 inches, how will the volume change?

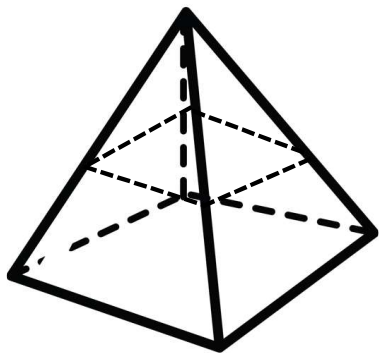
4. A grain silo is made up of a cylinder and a hemisphere. If the diameter of the silo is 10 ft. and the height is 40 ft., how much grain would fit inside?

5. A rectangular swimming pool is 10 ft. by 5 ft. by 15 ft. There is a plastic maintenance box at the bottom of the pool that is 2 ft. by 3 ft. by 1 ft. How much will the pool hold?

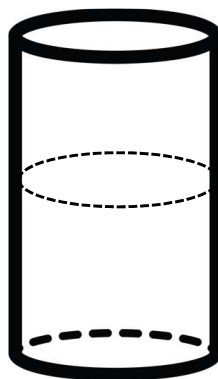
6. A cone has a radius of 4 inches and a height of 5 inches. If the radius is doubled and the height stays the same, how will the volume change?

# Cross Sections and Cavalieri's Principle-Practice

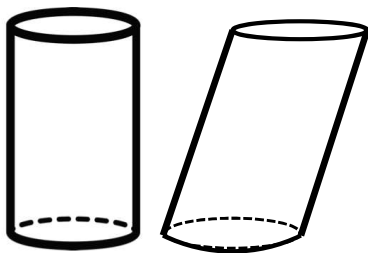
1. What shape would the cross section be for this square pyramid?



2. Draw the shape of the cross section.



3. These cylinders have the same height and radius. Do they have the same volume?

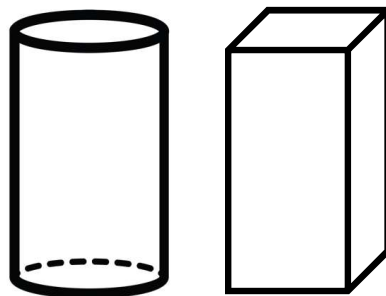


4. Finish the sentence:

Cavalieri said two solids will have the same volume if they have the same...

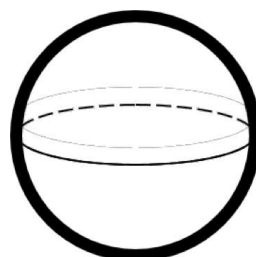
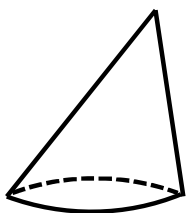
5. If you cut a rectangular prism parallel to the base, what would the cross section look like?

6. The cylinder and the prism have the same height and volume. What must be true about the square and circular bases?



7. This slanted cone has a radius of 5 inches and a height of 9 inches. What is the volume?

8. If you cut this sphere in half, what shape would the cross section be?



# Volume- Practice 2

1. A cylindrical tennis ball canister holds 3 tennis balls. The canister is 7 in. long with a diameter of 3 inches. The tennis balls also have a diameter of 3 inches. How many cubic inches of air is in the canister?

$$\text{Cylinder} = 49.5 \text{ in}^3$$

$$\text{Spheres (3)} = 42.4 \text{ in}^3$$

$$\underline{7.1 \text{ in}^3 \text{ of air}}$$

2. The trailer of a semi-truck is 45 ft. by 28 ft. by 28 ft. The trailer needs to transport boxes that are 4 ft. by 4 ft. by 2 ft. How many boxes can fit into the truck at one time?

$$\text{Rectangular Prism (truck)} = 35,280 \text{ in}^3$$

$$\text{Rectangular Prism (boxes)} = 32 \text{ in}^3$$

$$35280 / 32 = \underline{1,102 \text{ boxes}}$$

3. A spherical balloon has a radius of 3 inches. If you blow up the balloon so that the radius is now 6 inches, how will the volume change?

$$\text{1st balloon} = 113.1 \text{ in}^3$$

$$\text{2nd balloon} = 904.8 \text{ in}^3$$

$$904.77 / 113.1 = \underline{8 \text{ times bigger}}$$

4. A grain silo is made up of a cylinder and a hemisphere. If the diameter of the silo is 10 ft. and the height is 40 ft., how much grain would fit inside?

\*To get the height of JUST the cylinder, subtract the hemisphere (radius/height 5). The height of the cylinder is 35 ft.

$$\text{Cylinder} = 2,748.9 \text{ ft}^3$$

$$\text{Hemisphere} = 261.8 \text{ ft}^3$$

$$\underline{\text{Total} = 3,010.7 \text{ ft}^3}$$

5. A rectangular swimming pool is 10 ft. by 5 ft. by 15 ft. There is a plastic maintenance box at the bottom of the pool that is 2 ft. by 3 ft. by 1 ft. How much will the pool hold?

$$\text{Rectangular Prism (pool)} = 750 \text{ ft}^3$$

$$\text{Rectangular Prism (box)} = 6 \text{ ft}^3$$

$$750 - 6 = \underline{744 \text{ ft}^3}$$

6. A cone has a radius of 4 inches and a height of 5 inches. If the radius is doubled and the height stays the same, how will the volume change?

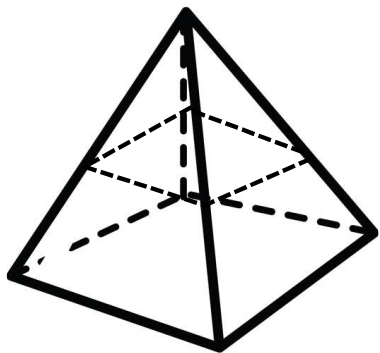
$$\text{1st cone} = 83.77 \text{ in}^3$$

$$\text{2nd cone} = 335.1 \text{ in}^3$$

$$335.1 / 83.77 = \underline{4 \text{ times bigger}}$$

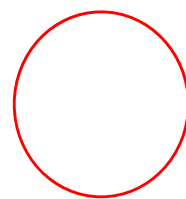
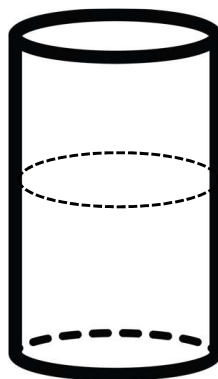
# Cross Sections and Cavalieri's Principle-Practice

1. What shape would the cross section be for this square pyramid?

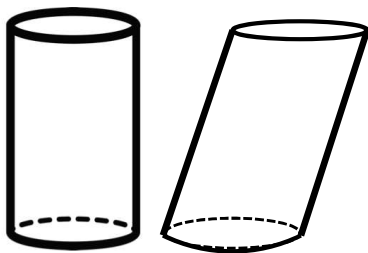


Square

2. Draw the cross section shape.



3. These cylinders have the same height and radius. Do they have the same volume?



Yes. Since they have the same radius, they will have the same cross-sectional area.

4. Finish the sentence:

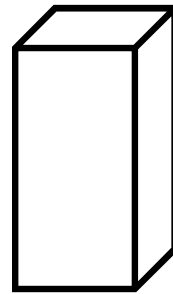
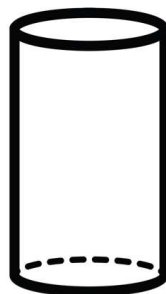
Cavalieri said two solids will have the same volume if they have the same...

height and cross-sectional area at every plane parallel to the base.

5. If you cut a rectangular prism parallel to the base, what would the cross section look like?

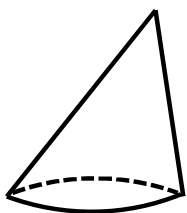
a rectangle or square

6. The cylinder and the prism have the same height and volume. What must be true about the square and circular bases?



the square and circle have the same area

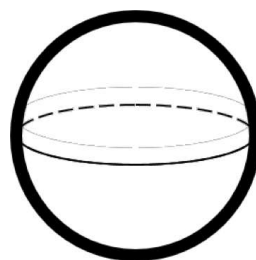
7. This slanted cone has a radius of 5 inches and a height of 9 inches. What is the volume?



$$V=235.6 \text{ in}^3$$

\*Just use cone formula!  
It does not matter that the cone is slanted as long as you have the height and radius.

8. If you cut this sphere in half, what shape would the cross section be?



circle