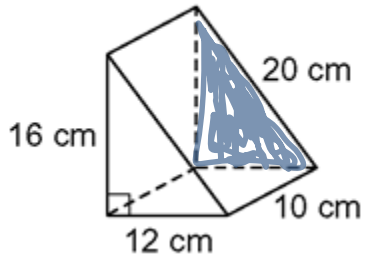
PCFU– Volumes of Three-Dimensional Solids Name _____

1) Find the volume of the triangular prism.



The first thing I had to do was figure out what part of the shape was the base. Once I saw that this triangular prism was on its side, I shaded the base so that I could understand a little better.

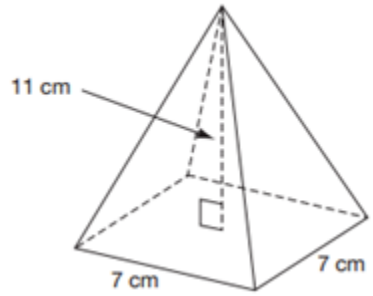
To find the volume of a prism, I need the find the area of the base and multiply that with the prism's height. Since the base is a triangle, I knew that I needed to use $A = \frac{1}{2}bh$ to find the area of the base. I substituted 12 for the length of the base of the triangle and 16 for the height of the triangle. So I got

$$A = \frac{1}{2}(12)(16) \rightarrow A = (6)(16) \rightarrow A = 96 \text{ cm}^2$$

Once I got the area of the triangular base, I needed to multiply by the height of the prism to find the volume.

$$V = Area\ of\ Base * height = 96 * 10 = 960 \text{ cm}^3$$

2) Find the volume of the square pyramid. Round your answer to the nearest hundredth.



To find the volume of a pyramid, I needed to use

$$V = \frac{1}{3}Area\ of\ the\ Base * height$$

The base is a square so to find the area I needed to do

$$A = s^2 = 7^2 = 49 \text{ cm.}$$

Once I had the area of the base, I just substituted the prism's height of 11 cm into the volume formula along with the area of the base.

$$V = \frac{1}{3}Area\ of\ the\ Base\ * height$$

$$V = \frac{1}{3}(49) * 11 \approx 179.67 \text{ cm}^3$$

3) Find the height of a cylinder with a volume of 500 yd^3 and a radius of 8 yd. Round your answer to the nearest hundredth.

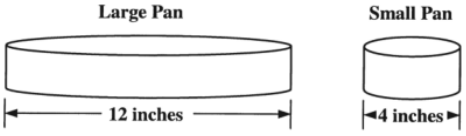
The formula for the volume of a cylinder is: $V = \pi r^2 h$.

Since I'd been given the radius and the volume, I substituted into the formula to solve for the height.

$$V = \pi r^2 h$$
$$500 = \pi 8^2 h$$
$$500 = 64\pi h$$
$$\frac{500}{64\pi} = \frac{64\pi h}{64\pi}$$
$$2.49\ yd. \approx h$$

4) Mrs. Olivares' consumer science class is making two different-size cheesecakes for a fundraiser.

- The large cheesecake pan has a diameter of 12 inches
- The small cheesecake pan has a diameter of 4 inches



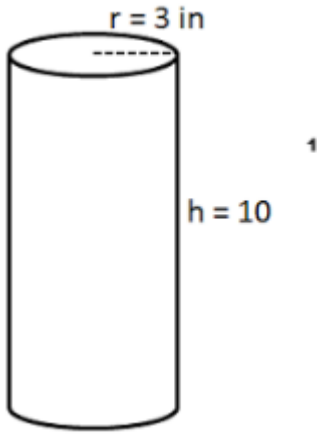
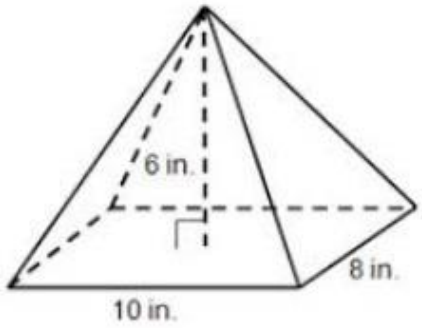
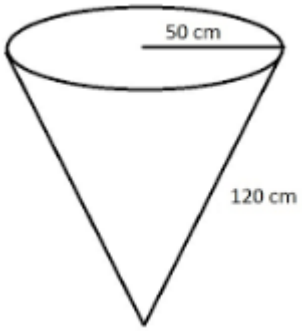
If the pans are both 3 inches deep, how many times greater is the volume of the large pan than that of the small pan?

The formula for volume of a cylinder is $V = \pi r^2 h$. I know the height of each of the two cylinders because height here is the same thing as depth, but I still need to find the radii. Since the diameter is given, I know the radius will be half that length . Therefore, the large radius is 6in. and the small radius is 2in. From there, I plug the information into the volume formula for each of the two pans.

Large Pan	Small Pan
$V = \pi(6)^2(3)$ $V = \pi(36)(3)$ $V = \pi(108)$	$V = \pi(4)^2(3)$ $V = \pi(16)(3)$ $V = \pi(48)$

In order to determine how many times greater the volume of the large pan is to the small pan, I divide the volume of the large pan by the volume of the small pan: $\frac{\pi(108)}{\pi(48)}$. The πs cancel out leaving me with $\frac{108}{48}$ which simplifies to $\frac{9}{4}$ *or* 2.25. Therefore, the large pan is 2.25 times greater than the small pan.

1. Find the volume of each of the following. Show your work. Round to the nearest hundredth when needed.

a)	b)	c)
		

2. Find the height of a square pyramid with a volume of 650 in^3 and a base side length of 5 in. Show your work.

3. How much larger is the volume of a cylinder than the volume of a cone if they both have a radius of 1in. and a height of 4in.? Show your work or explain your reasoning.