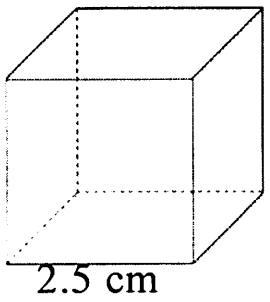
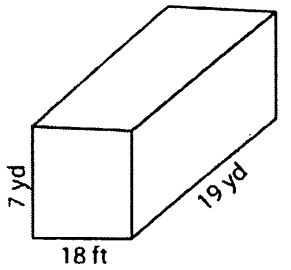
Math 8: Volume Unit Review Name _____

Find the Volume of the Following 3D Figures. Don't Forget Formula, Substitute, Solve

1. Cube

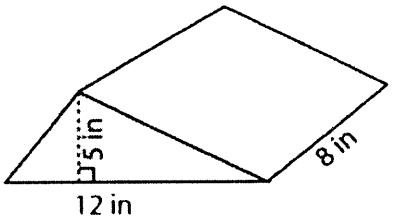


2. Rectangular Prism



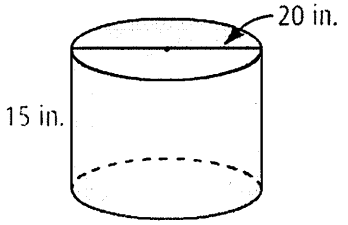
_____ yd³

3. Triangular Prism



4. Cylinder

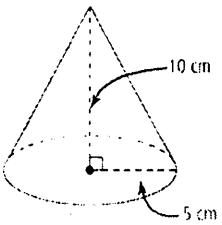
To the nearest cubic inch



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

5. Cone

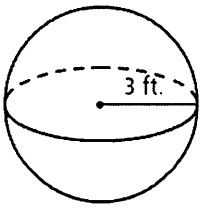
In terms of π



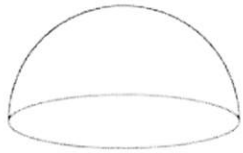
$$V = \frac{1}{3}\pi \bullet r^2 \bullet h$$

6. Sphere

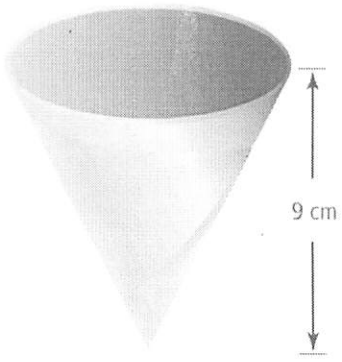
To the nearest tenth



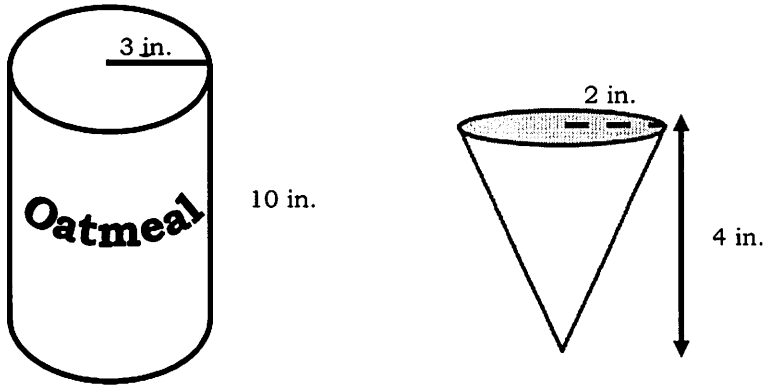
$$V = \frac{4}{3}\pi \bullet r^3$$

7. The volume of a cylinder is 324π yd^3. The height of the cylinder is 16 yd. What is the radius of the cylinder?	8. A cone has a volume of 2544 cubic centimeters and a diameter of 18 inches. What is the height of the cone to the nearest centimeter?
9. A right rectangular prism has a volume of 440 in^3. The length and width of the prism is 8 by 11 inches. What is the height of the prism?	10. The diameter of the dome is 28 inches. What is the volume? Leave in terms of π. 

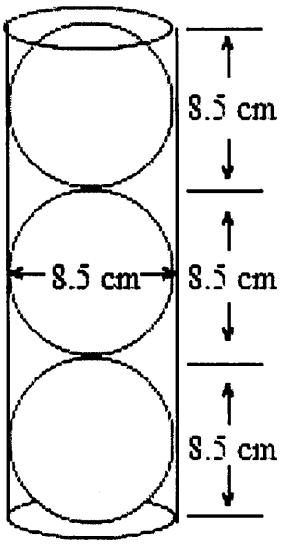
11. A shaved-ice vender wants a new cone to hold about 150 cm^3 of shaved ice when filled to the brim. To the nearest centimeter, what should the radius of the cone be?



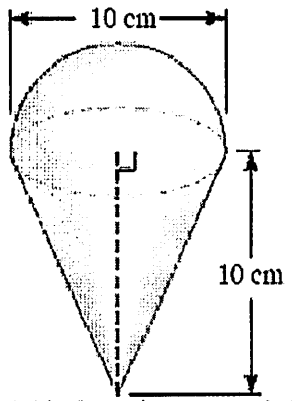
12. Ms. Clays Wants to fill her oatmeal container in the shape of a cylinder full of oatmeal. She has a cone shape scoop that she will use to fill the container. How many scoops will it take Ms. Clays to fill the entire cylinder of oatmeal?



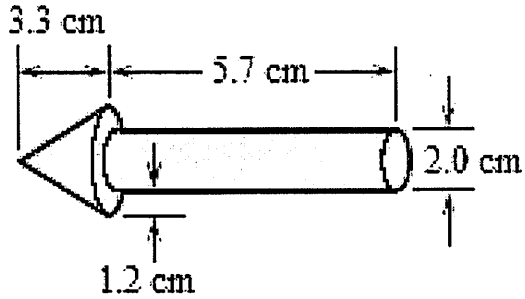
13. Three tennis balls are placed inside a container shaped as a cylinder. Determine the amount of space inside the container that is not taken up by the tennis balls to the nearest tenth.



14. Find the Volume of the Composite Shapes to the nearest whole number.



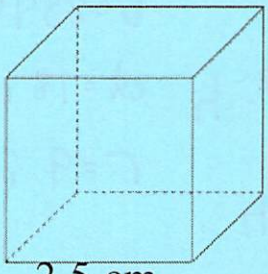
(This figure is not to scale.)



Math 8: Volume Unit Review Name Key

Find the Volume of the Following 3D Figures. Don't Forget Formula, Substitute, Solve

1. Cube

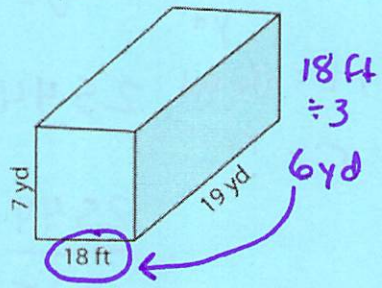


$V = L \times W \times H$

$V = 2.5 \cdot 2.5 \cdot 2.5$

$V = 15.625\ cm^3$

2. Rectangular Prism



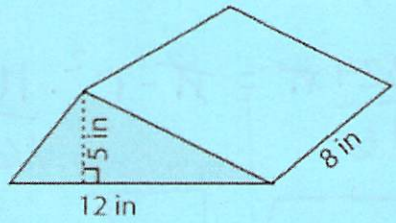
$V = L \times W \times H$

$V = 19 \cdot 6 \cdot 7$

$V = 798\ yd^3$

798 yd^3

3. Triangular Prism



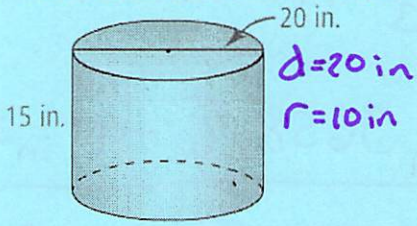
$V = \frac{L \times W \times H}{2}$

$V = \frac{12 \cdot 5 \cdot 8}{2}$

$V = 240\ in^3$

4. Cylinder

To the nearest cubic inch



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

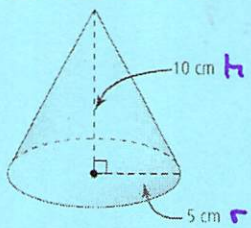
$V = \pi \cdot 10^2 \cdot 15$

$V = \pi \cdot 1500$

$V = 4712\ in^3$

5. Cone

In terms of π



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

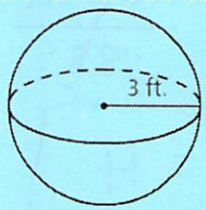
$V = \frac{1}{3} \cdot \pi \cdot 5^2 \cdot 10$

$V = \frac{1}{3} \cdot 25 \cdot 10 \cdot \pi$

$V = 83.\overline{3} \cdot \pi\ cm^3$

6. Sphere

To the nearest tenth



$V = \frac{4}{3} \pi \cdot r^3$

$V = \frac{4}{3} \cdot \pi \cdot 3^3$

$V = \frac{4}{3} \cdot \pi \cdot 27$

$V = 113.1\ ft^3$

7. The volume of a cylinder is 324π yd^3. The height of the cylinder is 16 yd. What is the radius of the cylinder?

$V = \pi \cdot r^2 \cdot h$ $\quad V = 324\pi$ yd^3

$\frac{324\pi}{16} = \frac{\pi \cdot r^2 \cdot 16}{16}$ $\quad h = 16$ yd

$\sqrt{20.25} = \sqrt{r^2}$ $\quad r = ?$

4.5 yd $= r$

8. A cone has a volume of 2544 cubic centimeters and a diameter of 18 inches. What is the height of the cone to the nearest centimeter?

$V = \frac{1}{3}\pi r^2 h$ $\quad V = 2544$ cm^3

$2544 = \frac{1}{3} \cdot \pi \cdot 9^2 \cdot h$ $\quad d = 18$ in

$r = 9$ in

$\frac{2544}{27\pi} = \frac{27\pi \cdot h}{27\pi}$

30 in $= h$

9. A right rectangular prism has a volume of 440 in^3. The length and width of the prism is 8 by 11 inches. What is the height of the prism?

$V = L \times W \times H$ $\quad V = 440$ in^3

$440 = 8 \cdot 11 \cdot H$ $\quad L = 8$ in

$\frac{440}{88} = \frac{88 \cdot H}{88}$ $\quad W = 11$ in

$H = ?$

5 in $= H$

10. The diameter of the dome is 28 inches. What is the volume? Leave in terms of π.

$d = 28$ in

$r = 14$ in

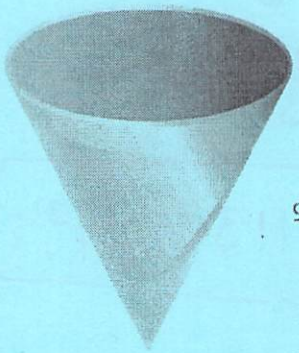
$V = \frac{4}{3}\pi r^3$

$V = \frac{4}{3} \cdot 14^3 \cdot \pi$

$V_{Full} = 3658.\overline{6} \cdot \pi$ in^3

$V_{\frac{1}{2}} = 1829.\overline{3}\,\pi$ in^3

11. A shaved-ice vender wants a new cone to hold about 150 cm^3 of shaved ice when filled to the brim. To the nearest centimeter, what should the radius of the cone be?



$V = \frac{1}{3} \cdot \pi \cdot r^2 \cdot h$ $\quad V = 150$ cm^3

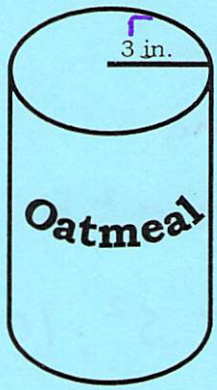
$150 = \frac{1}{3} \cdot \pi \cdot r^2 \cdot 9$ $\quad H = 9$ cm

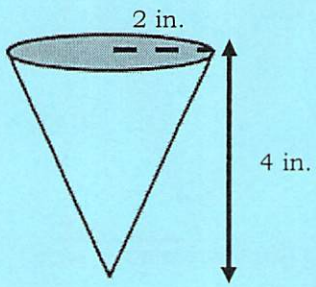
$\frac{150}{3\pi} = \frac{3\pi \cdot r^2}{3\pi}$ $\quad r = ?$

$\sqrt{15.915} = \sqrt{r^2}$

4 cm $= r$

12. Ms. Clays Wants to fill her oatmeal container in the shape of a cylinder full of oatmeal. She has a cone shape scoop that she will use to fill the container. How many scoops will it take Ms. Clays to fill the entire cylinder of oatmeal?





$V_{cylinder} \div V_{cone}$

$90\pi \div \frac{16}{3}\pi$

16.875

So...

17 scoops Needed to fill Oatmeal Container

$V = \pi r^2 h$

$V = \pi \cdot 3^2 \cdot 10$

$V = 90\pi$

$V = 282.743 \text{ in}^3$

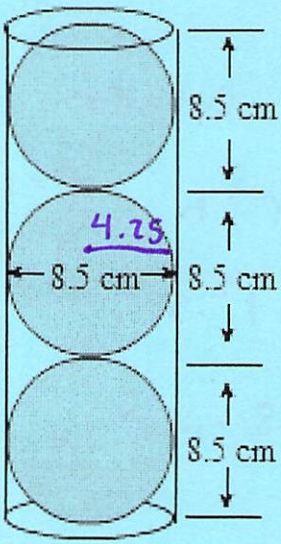
$V = \frac{1}{3}\pi r^2 h$

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

$V = \frac{16}{3}\pi$

$V = 16.755$

13. Three tennis balls are placed inside a container shaped as a cylinder. Determine the amount of space inside the container that is not taken up by the tennis balls to the nearest tenth.



Cylinder

$V = \pi \cdot r^2 \cdot h$ $r = 4.25$ cm, $h = 25.5$ cm

$V = \pi \cdot (4.25)^2 \cdot 25.5$

$V = 1447.0 \text{ cm}^3$

Sphere

$V = \frac{4}{3}\pi r^3$

$V = \frac{4}{3}\pi (4.25)^3$

$V = 321.5 \text{cm}^3 \times 3 \text{ Balls} = 964.5 \text{cm}^3$

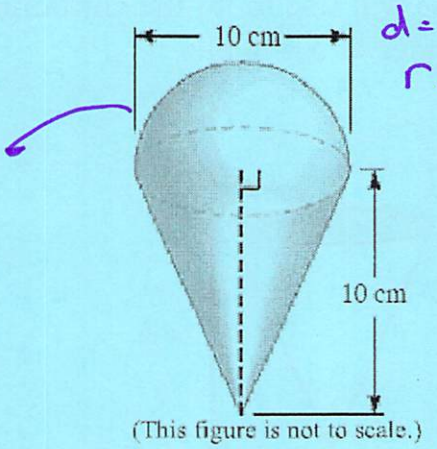
Empty Space

1447.0 cm^3

$- \ 964.5 \text{ cm}^3$

482.5 cm^3

14. Find the Volume of the Composite Shapes to the nearest whole number.



$d = 10$

$r = 5$

Semi-Sphere

$V = \frac{4}{3} \cdot \pi \cdot r^3$

$V = \frac{4}{3} \cdot \pi \cdot 5^3$

$V = 523.598$

$\div 2$

$V = 262 \text{ cm}^3$

$\frac{1}{2}$

Cone

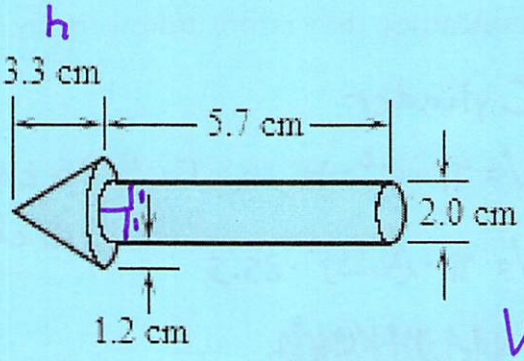
$V = \frac{1}{3} \pi r^2 h$

$V = \frac{1}{3} \pi 5^2 \cdot 10$

$V = 262 \text{ cm}^3$

Total Volume

524 cm³



Cone

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

$h = 3.3 \text{ cm}$

$r = 1.2 + 1 = 2.2 \text{ cm}$

$V = \frac{1}{3} \cdot \pi \cdot (2.2)^2 \cdot 3.3$

$V = 17 \text{ cm}^3$

Cylinder

$V = \pi r^2 h$

$r = 1$

$h = 5.7$

$V = \pi \cdot 1^2 \cdot 5.7$

$V = 18 \text{ cm}^3$

Total Volume

35 cm³