

Name: Key

Putting it All Together! Day 1 In-Class

1. **AQUARIUM** The New England Aquarium in Boston, Massachusetts, has one of the world's largest cylindrical tanks. The Giant Ocean Tank holds approximately 200,000 gallons and is 23 feet deep. If it takes about $7\frac{1}{2}$ gallons of water to fill a cubic foot, what is the radius of the Giant Ocean Tank?

$V = B \cdot H$

Find volume!

$200,000 \div 7.5$

$V = 26666.7 \text{ ft}^3$

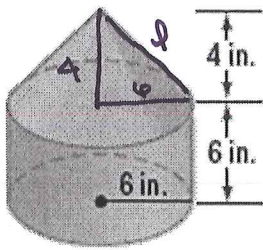
$V = B \cdot H$ $H = 23 \text{ ft}$
 $B = \pi r^2$

$\frac{26666.7}{(\pi \cdot 23)} = \frac{\pi r^2 \cdot 23}{(\pi \cdot 23)}$

$\sqrt{369.1} = \sqrt{r^2}$

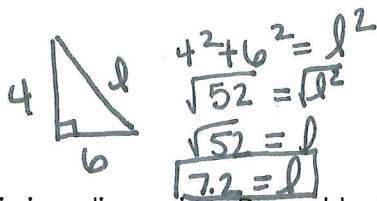
$19.2 \text{ ft} = r$

2. Find the surface area and volume of the following figure.



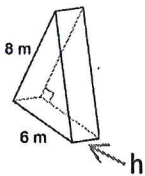
$V = \frac{1}{3} B \cdot H + B \cdot H$
 $V = \frac{1}{3} \pi 6^2 \cdot 4 + \pi 6^2 \cdot 6$
 $V \approx 829.4 \text{ in}^3$

$SA = 2\pi r^2 + 2\pi rH + \pi r^2$
 $SA = \pi 6^2 + 2\pi 6 \cdot 6 + \pi 6 \cdot 7.2$
 $SA \approx 475.0 \text{ in}^2$



Examples: Find the missing dimension. Round to the nearest tenth.

3. The volume of a triangular prism is 96 m^3 . The prism has a right triangle base with legs of 8 meters and 6 meters. Find the height of the prism.

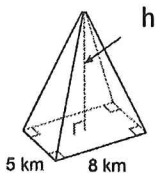


$V = B \cdot H$
 $96 = \frac{1}{2} 6 \cdot 8 \cdot H$
 $96 = 24H$

$B = \frac{1}{2} b \cdot h = \frac{1}{2} 6 \cdot 8$

$H = 4 \text{ m}$

4. The volume of the rectangular pyramid has a volume of about 146.67 km^3 . The base of the pyramid is a rectangle that is 5 km by 8 km. Find the height of the pyramid.



$V = \frac{1}{3} B \cdot H$
 $146.67 = \frac{1}{3} 5 \times 8 \cdot H$
 $146.67 = 13.3H$

$H = 11.03 \text{ km}$

or
 $H = 11 \text{ km}$

5. The volume of a cylinder is 616π cubic meters and the height is 4 meters. Find the length of the diameter of the cylinder.

B = area of circle

$V = B \cdot H$
 $\frac{616\pi}{4} = \frac{\pi r^2 \cdot 4}{4}$

$\sqrt{r^2} = \sqrt{154}$
 $r = 12.4 \text{ m}$

Find diameter!
 $d = 24.4 \text{ m}$

6. The volume of a rectangular prism is 1152 cubic inches and the area of the base is 64 square inches. Find the height of the prism.

$V = B \cdot H$
 $1152 = 64H$

$H = 18 \text{ in}$

7. The surface area of a cone is $261.9\pi \text{ km}^2$. The cone has a diameter of 18 km . Find the slant height of the cone.

$$SA = \pi r^2 + \pi r l$$

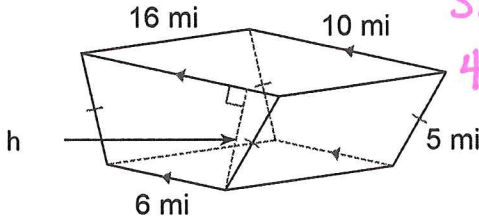
$$261.9\pi = \pi 9^2 + \pi 9l$$

$$\begin{aligned} 261.9\pi &= 81\pi + 9\pi l \\ -81\pi & \quad -81\pi \\ \hline 180.9\pi &= 9\pi l \\ \frac{180.9\pi}{(9\pi)} &= \frac{9\pi l}{(9\pi)} \end{aligned}$$

$$r = 9 \text{ km}$$

$$l = 20.1 \text{ km}$$

8. The surface area of the trapezoidal prism is 489.6 mi^2 . Find the missing length below.



$SA = 2 \text{ traps} + \text{top} + \text{bottom} + 2 \text{ sides}$

$$489.6 = 2\left(\frac{1}{2}h(10+6)\right) + 16 \times 10 + 16 \times 6 + 2(5 \times 16)$$

$$489.6 = h(10+6) + 416$$

$$489.6 = 16h + 416$$

$$-416 \quad -416$$

$$73.6 = 16h$$

$$\boxed{4.6 \text{ mi} = h}$$

9. **PARTY HATS** Shelley plans to make eight conical party hats for her niece's birthday. If each hat is to be 18 inches tall and the bases of each to be 22 inches in circumference, how much material will she use to make the hats?

$$C = 22$$

$$\frac{d\pi}{\pi} = \frac{22}{\pi}$$

$$d = 7$$

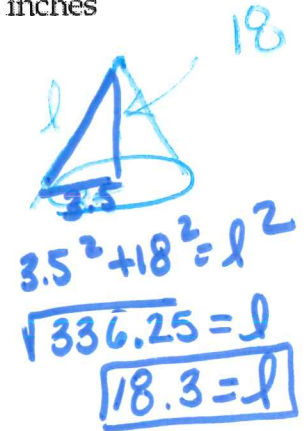
$$\boxed{r = 3.5 \text{ in}}$$

$$SA = \pi r^2 + \pi r l$$

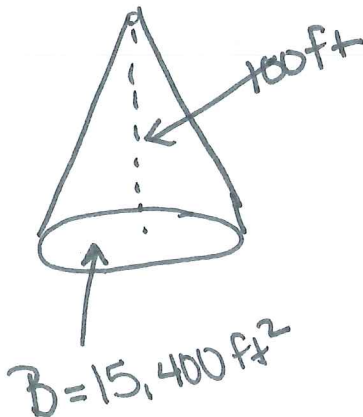
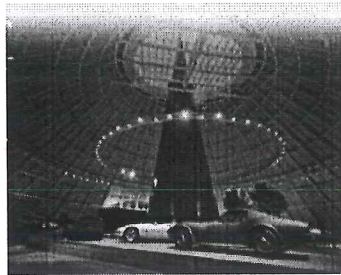
$$SA = \pi 3.5^2 + \pi 3.5 \times 18.3$$

$$LA = 8(\pi 3.5 \times 18.3)$$

$$\boxed{LA = 1609.8 \text{ in}^2}$$



10. **MUSEUMS** The skydome of the National Corvette Museum in Bowling Green, Kentucky, is a conical building. If the height is 100 feet and the area of the base is about 15,400 square feet, find the volume of air that the heating and cooling systems would have to accommodate. Round to the nearest tenth.



$$V = \frac{1}{3} B \cdot H$$

$$V = \frac{1}{3} 15,400 \cdot 100$$

$$\boxed{V \approx 513333.\bar{3} \text{ ft}^3}$$