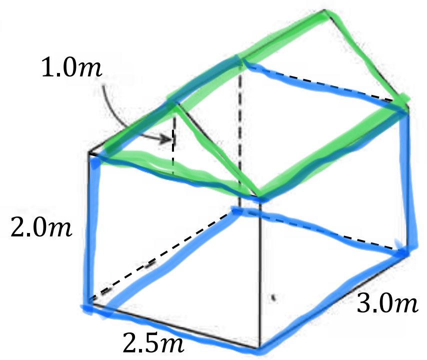
Section 3.5 – Practice Problems

1. Determine the Volume of the following composite shape. Round to the nearest tenth if necessary.



We have a cuboid and a triangular prism

V of Cube

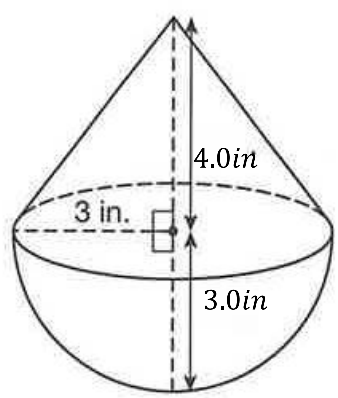
$2.5 \cdot 2 \cdot 3 = 15$

V of Triangular Prisms

$\frac{2.5 \cdot 3 \cdot 1}{2} = 3.75$

$\boxed{\text{Total Volume: } 18.75}$

2. Determine the Volume of the following composite shapes. Round to the nearest tenth if necessary.



V of Cone and V of $\frac{1}{2}$ sphere

$\frac{1}{3}\pi r^2$

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

$\frac{1}{3}(3.14)(3)^2$

$\frac{4}{3}\pi(3)^3 = 113.04$

$\frac{113.04}{2}$

9.42 in^3

$\boxed{\text{Total: } 65.9 \text{ in}^3}$

56.52 in^3

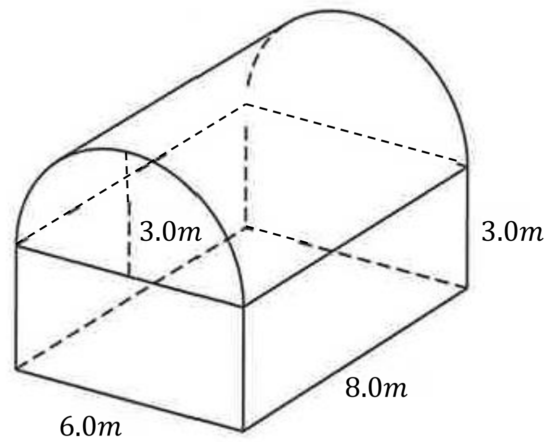
3. Determine the Volume of the following composite shapes. Round to the nearest tenth if necessary.

V of rectangular prism

$6 \cdot 8 \cdot 3 = 72 m^3$

$\frac{V \text{ of cylinder}}{2} = \frac{\pi r^2 \cdot h}{2}$

$\frac{3.14 \cdot 3^2 \cdot 8}{2} = 113.04\ m^3$



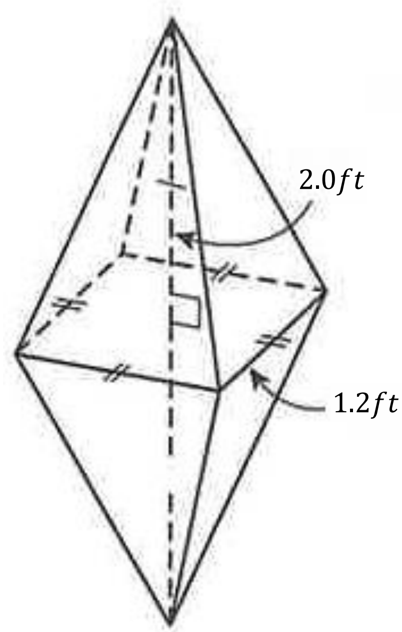
$\boxed{\text{Total Volume } 185.0 m^3}$

4. Determine the Volume of the following composite shapes. Round to the nearest tenth if necessary.

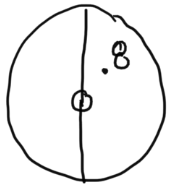
V of Square Based Pyramid $\cdot$ 2

$\left(\frac{1}{3} \cdot 1.2^2 \cdot 2 \right) \cdot 2$

$\boxed{1.92\ ft^3}$



5. Daniella and her friend Ashley make jewellery. They are making pearl necklaces where each pearl has a diameter of $0.8cm$. A cylindrical is drilled into each pearl to allow the pearls to be strung. The hole has a radius of $0.9mm$. What is the volume of each pearl to the nearest millimeter (Watch you mm and cm, they need to be the same.



r of pearl is $\frac{.8}{2} = .4$

V of sphere pearl $\frac{4}{3}\pi r^3 \rightarrow \frac{4}{3}\pi(0.4)^3$

V of cylinder $0.9mm \rightarrow \boxed{0.09cm}$

$0.27 \rightarrow \boxed{0.3 cm^3}$

$\pi r^2 h$ h is diameter $0.8cm$

$\pi(.09)^2(0.8) = \boxed{0.02cm^3}$

Total Volume: $0.3 - 0.02$

$\boxed{= 0.28 cm^3}$

6. Complete the chart below.

Object	Volume	Action Taken	New Volume	Ratio (Fraction)
Square Pyramid $l = 3cm$ $h = 7cm$	$\frac{1}{3}(b)^2 \cdot h$ $\frac{1}{3}(3)^2 \cdot 7$ $\frac{9}{3} \cdot 7 = \boxed{21 cm^3}$	Double the length and the width of the base	$3 \rightarrow 6$ $\frac{1}{3}(6)^2 \cdot 7$ $\frac{36}{3} \cdot 7 = \boxed{84 cm^3}$	$\frac{84}{21}$ $\downarrow$ $\boxed{4}$ 4:1
Cone $r = 5cm$ $h = 6cm$	$V = \frac{1}{3}\pi r^2 \cdot h$ $\frac{1}{3}(3.14)(5)^2(6)$ $= \boxed{157 cm^3}$	Double the radius	$5 \rightarrow 10$ $\frac{1}{3}(3.14)(10)^2(6)$ $\boxed{628 cm^3}$	$\frac{628}{157}$ $\downarrow$ $\boxed{4}$ 4:1

Cube $l = 4cm$	$V = 4^3 = 64cm^3$	Double the side length	$4 \to 8$ $V = 8^3 = 512$ $\boxed{512cm^3}$	$\frac{512}{64}$ $\downarrow$ $\boxed{8}$ $8:1$

7. A granola bar has a length of $5in.$, a width of 1 and a half inches, and a height of $\frac{3}{4}$ of an inch. How can you change the dimensions to create a larger bar with four times the volume? Check your strategy. (Hint: Calculate the original volume, multiply it by 4 and then solve for one of the parameters as an unknown.)

$l = 5 \quad w = 1.5 \quad h = 0.75$

Original Volume: $l \cdot w \cdot h = 5.625 in^3$

New volume needs to be: $4 \cdot 5.625 = 22.5 in^3$

Lets change the l only.

$V = l \cdot w \cdot h$

$22.5 = l \cdot 1.5 \cdot 0.75$

$\frac{22.5}{1.125} = \frac{1.125l}{1.125}$

* we multiply any parameter by 4

$1.5 \cdot 4 = \boxed{6}$

$0.75 \cdot 4 = \boxed{3}$

$\boxed{l = 20}$
$\boxed{w = 6}$
$\boxed{h = 3}$
only change one of them