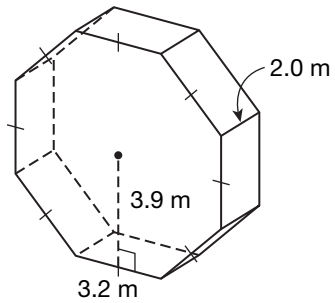
Chapter Review

1. Calculate the volume of each object.

a)



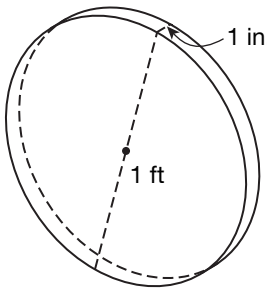
$V = (A_{base})(h)$

$= \left[\frac{8(3.9\text{ m})(3.2\text{ m})}{2}\right](2\text{ m})$

$= 99.84\text{ m}^3$,

or about 100 m^3

b)



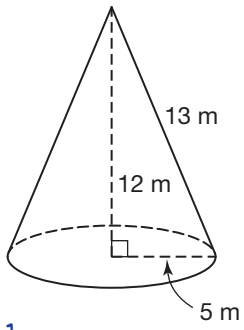
$V = \pi r^2 h$

$= \pi(6\text{ in.})^2(1\text{ in.})$

$= 113.097...\text{ cu in.}$,

or about 113 cu in.

c)

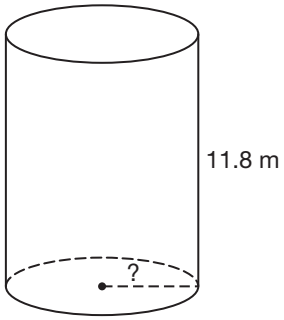


$V = \frac{1}{3}\pi r^2 h$

$= \frac{1}{3}\pi(5\text{ m})^2(12\text{ m})$

$= 314.159...\text{ m}^3$,

or about 314 m^3



2. This cylindrical storage tank has a volume of 750.7 m^3. The tank has a height of 11.8 m. What is its radius to the nearest tenth of a metre?

e.g., $V = \pi r^2 h$

$750.7\text{ m}^3 = \pi r^2(11.8\text{ m})$

$750.7\text{ m}^3 = (37.070...\text{ m})r^2$

$750.7\text{ m}^3 \div 37.070...\text{ m} = (37.070...\text{ m})r^2 \div 37.070...\text{ m}$

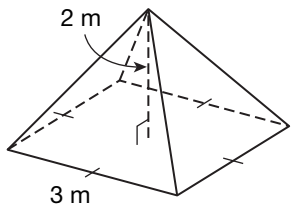
$20.250...\text{ m}^2 = r^2$

$\sqrt{20.250...} = r$

$4.500... = r$

The radius of the tank is 4.5 m, to the nearest tenth of a metre.

3. Determine the volume of the square pyramid.



e.g., $V_A = \frac{1}{3}(A_{base})(h)$

$= \frac{1}{3}(3\text{ m})^2(2\text{ m})$

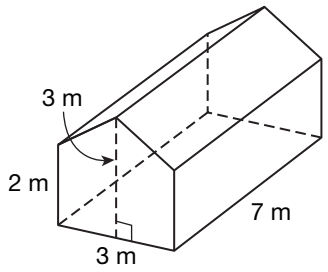
$= 6\text{ m}^3$

4. Create a problem where you need to determine the volume of an object measured in cubic feet.

e.g., Determine the volume of a stack of solid bricks that is 4 ft tall, 2 ft wide, and 3 ft long.

5. Determine the volume of each composite object.

a)

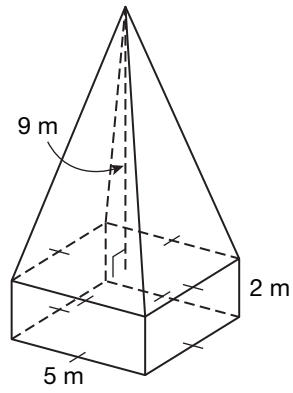


$V = lwh_1 + \left(\frac{bh_2}{2}\right)(h_1)$

$= (3\text{ m})(2\text{ m})(7\text{ m}) + \left[\frac{(3\text{ m})(1\text{ m})}{2}\right](7\text{ m})$

$= 52.5\text{ m}^3$, or about 53 m^3

b)



$V = lwh_1 + \frac{1}{3}(A_{base})(h_2)$

$= (5\text{ m})(5\text{ m})(2\text{ m}) + \frac{1}{3}(5\text{ m})^2(9\text{ m})$

$= 125\text{ m}^3$

6. Martina says that if you triple the inner radius of a cylindrical container and keep the height the same, its capacity will also triple. Is she correct? Use an example in your explanation.

No. e.g., Its capacity will increase by a factor of 9.

$V_{original} = \pi r^2 h$

$V_{new} = \pi(3r)^2 h$

$= 9\pi r^2 h$

7. A spherical gas storage tank has an inner radius of 10 m. Determine its capacity, to the nearest litre.

e.g., $V = \frac{4}{3}\pi r^3$

$= \frac{4}{3}\pi(1000\text{ cm})^3$

$= 4\,188\,790\,205\text{ cm}^3$, or $4\,188\,790\,205\text{ mL}$

$4\,188\,790\,205\text{ mL} \times \frac{1}{1000}\text{ L/mL} = 4\,188\,790.205\text{ L}$

The capacity of the tank is 4 188 790 L, to the nearest litre.