

1. Given that **1 in. = 2.54 cm** and **12 in. = 1 ft** complete the conversions below.

$$3 \text{ in.} = \underline{7.62} \text{ cm}$$

$$\begin{aligned} 3 \times 2.54 \\ = 7.62 \end{aligned}$$

$$14 \text{ in.}^2 = \underline{90.32} \text{ cm}^2$$

$$14 \times 2.54^2 = 90.32$$

$$62 \text{ in.}^3 = \underline{1016} \text{ cm}^3$$

$$\begin{aligned} 62 \times 2.54^3 \\ = 1016 \end{aligned}$$

$$13 \text{ cm} = \underline{5.12} \text{ in.}$$

$$\frac{13}{2.54} = 5.12$$

$$10 \text{ ft.}^2 = \underline{1440} \text{ in.}^2$$

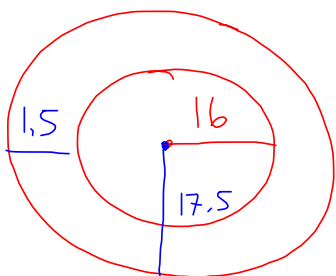
$$10 \times 12^2 = 1440$$

$$32 \text{ in.}^3 = \underline{0.02} \text{ ft.}^3$$

$$\frac{32}{12^3}$$

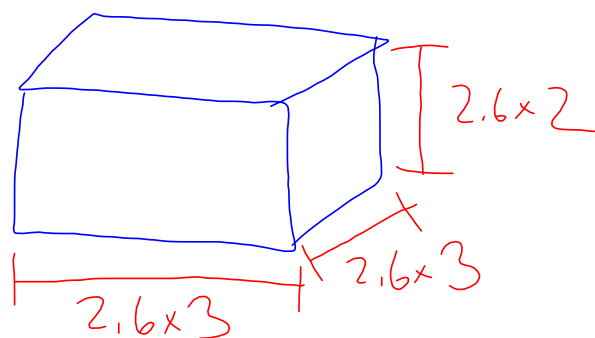
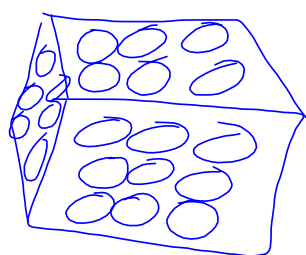
2. A circular in-ground garden pond has a radius of 16 m. A 1.5 m concrete deck will be constructed around the pond. The concrete should be 12 cm thick. Calculate the volume of concrete required to construct the deck.

0.12 m



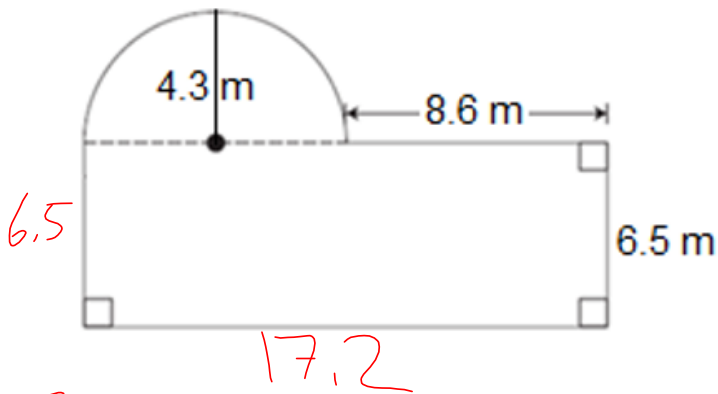
$$\begin{aligned}V_{\text{CEMENT}} &= V_{\text{Entire}} - V_{\text{middle}} \\ &= \pi(17.5)^2(0.12) - \pi(16)^2(0.12) \\ &= 18.9 \text{ m}^3\end{aligned}$$

3. Tennis balls are stacked three wide by three deep by two high in a square-based prism package. The diameter of one ball is 2.6 inches.
Draw a labelled diagram and determine the volume of the box.



$$\begin{aligned} V &= lwh \\ &= (7.8)(7.8)(5.2) \\ &= 316.4 \text{ in.}^3 \end{aligned}$$

4. A garden is in the shape of a rectangle and a semicircle as shown below.
- How much fencing is required to enclose the garden? (3 marks)
 - What is the total area of the garden? (3 marks)
 - If the garden is to have a depth of 0.3 m, what is the volume?



a.

$$P = 6.5 + 17.2 + 6.5 + 8.6 + \frac{2\pi(4.3)}{2}$$

$$= 52.3 \text{ m}$$

b.

$$A = (17.2)(6.5) + \frac{\pi(4.3)^2}{2}$$

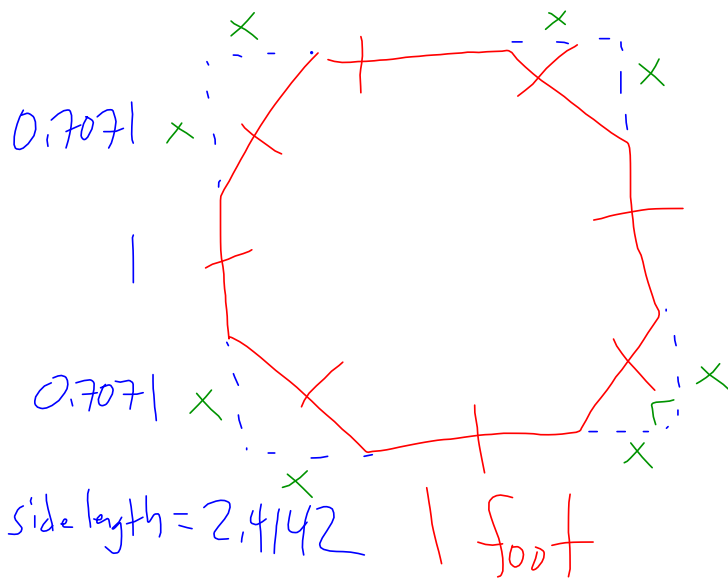
$$= 140.8 \text{ m}^2$$

c.

$$V = 140.8 \times 0.3$$

$$= 42.24 \text{ m}^3$$

5. A stop sign is a regular octagon (8-sided polygon where all sides are the same). Determine the area of a stop sign where each side length is 2 feet. Include a diagram.



Pythagorean Theorem

$$x^2 + x^2 = 1^2$$

$$2x^2 = 1$$

$$x^2 = 0.5$$

$$x = 0.7071$$

$$\begin{aligned} \text{Area of square} &= 2.4142 \times 2.4142 \\ &= 5.83 \text{ ft}^2 \end{aligned}$$

$$\begin{aligned} \text{Area stop sign} &= 5.83 - 4(\text{triangle}) \\ &= 5.83 - 4\left(\frac{0.7071 \times 0.7071}{2}\right) \\ &= 5.83 - 1 \\ &= 4.83 \text{ ft}^2 \end{aligned}$$

6. Describe two methods that you could use to determine the area of the figure below. Verify that both methods are the same by creating equations for each.

