

Course: MFM2P Gr. 10 AppliedLesson: 8 - 4Unit: Volume and Surface AreaTopic: Surface Area and Volume of Cylinders

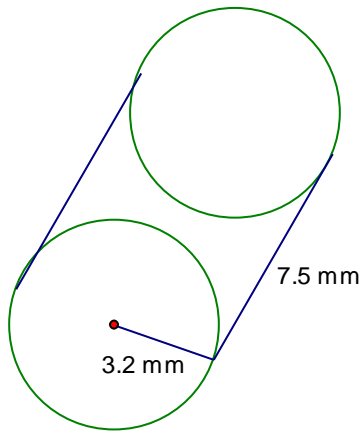
✚ **homework check: Lesson 8 - 3**

✚ **note: Surface Area and Volume of Cylinder**

The surface area of a cylinder is the sum of the faces of all three sides. The circular faces of the top and bottom are identical and the side of the cylinder can be opened up into a rectangular shape with a length the same as the circumference of the circular face. For this reason, the formula for the surface area of a cylinder is  $SA = 2\pi r^2 + 2\pi rh$ . The area of the circular faces (the top and bottom are equal) is  $2\pi r^2$ . The circumference of the circular face is  $2\pi r$  which is multiplied by the height to represent the area of the side of the cylinder.

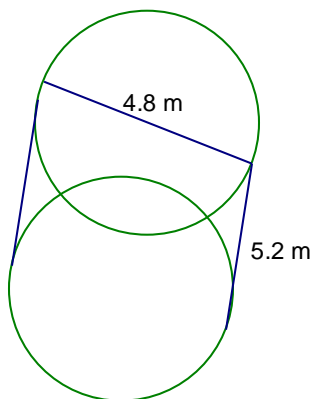
The volume of a cylinder can be found by multiplying the base area by the height just as in any other prism. For a cylinder the formula for volume is  $V = \pi r^2 h$ .

For example, find the volume and surface of each of the following cylinders.



$$\begin{aligned} SA &= 2\pi r^2 + 2\pi rh \\ &= 2\pi (3.2)^2 + 2\pi (3.2)(7.5) \\ &= 64.34 + 150.80 \\ &= 215.14 \text{ mm}^2 \end{aligned}$$

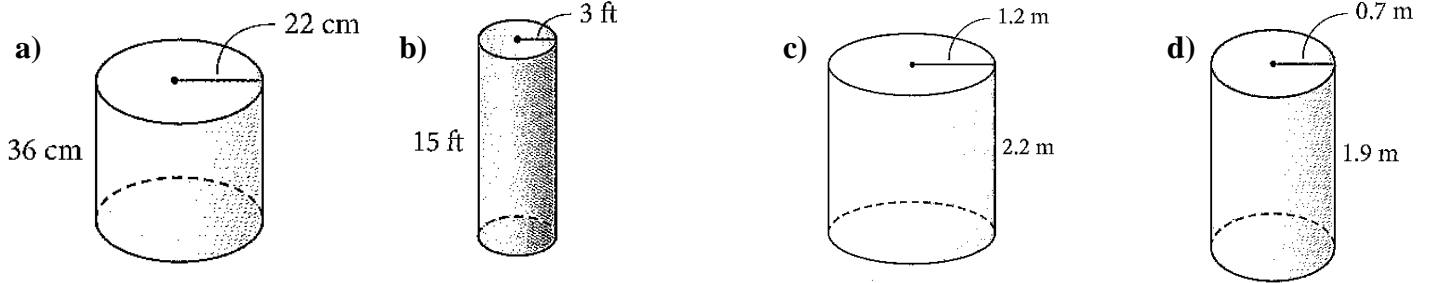
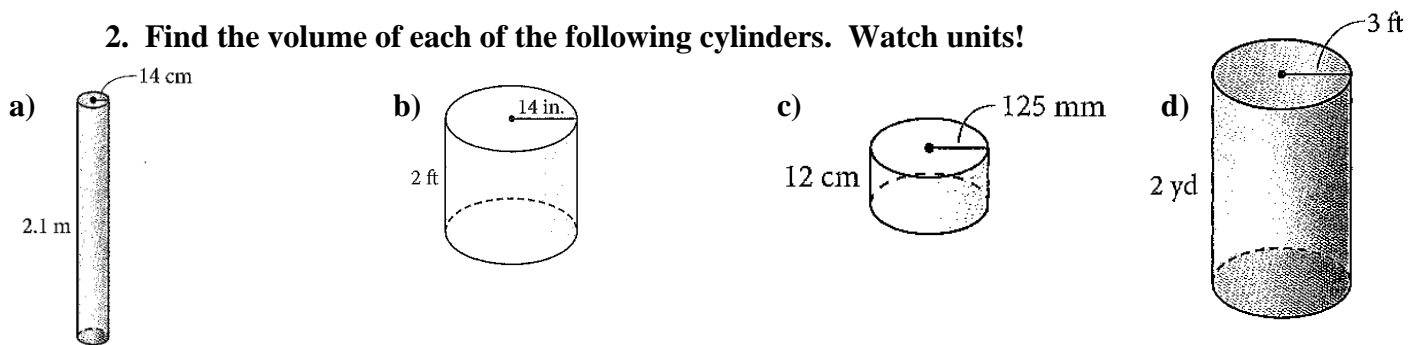
$$\begin{aligned} V &= \pi r^2 h \\ &= \pi (3.2)^2 (7.5) \\ &= 241.3 \text{ mm}^3 \end{aligned}$$



$$\begin{aligned} SA &= 2\pi r^2 + 2\pi rh \\ &= 2\pi (2.4)^2 + 2\pi (2.4)(5.2) \\ &= 36.19 + 78.4 \\ &= 150.78 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} V &= \pi r^2 h \\ &= \pi (2.4)^2 (5.2) \\ &= 94.1 \text{ m}^3 \end{aligned}$$

✚ **homework assignment: Lesson 8 - 4**

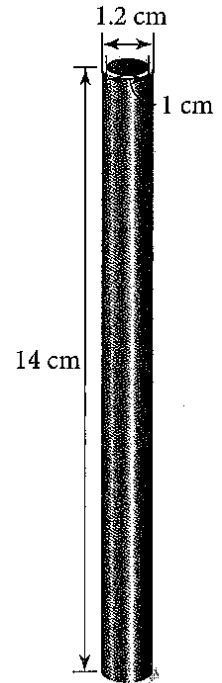
**Lesson 8 – 4: Surface and Area of Cylinders****1. Find the surface area of each of the following cylinders.****2. Find the volume of each of the following cylinders. Watch units!****3. Find the volume AND surface area of each cylinder. Watch units.**

4. A cylindrical copper bolt sleeve is made by drilling out the centre of a cylindrical piece of copper. The radius of the piece of copper is 1.2 cm and the radius of the hole is 1 cm. The length of the piece of copper is 14 cm.

a) Find the total volume of the copper bolt before the hole is drilled.

b) Find the volume of the hole drilled in the copper bolt.

c) Find the amount of copper left once the hole is drilled.



5. Find the amount of material needed to make the hollow cylinder shown.

