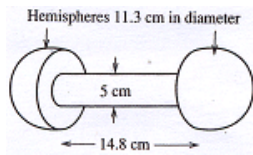


MCT4CI Final Review 7 (updated-Fall 14)

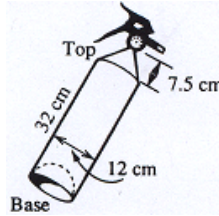
Round all measurements to 3 decimal places, and all angles to 2 decimal places.

1. Determine the volume of each figure.

a)



b)



$$V_{\text{figure}} = V_{\text{cyl}} + V_{\text{cone}} - V_{\frac{1}{2}\text{sphere}}$$

$$= 3619.1147 + 282.7433 - 452.388$$

$$= 3449.4687$$

$$= 3449.469 \text{ cm}^3$$

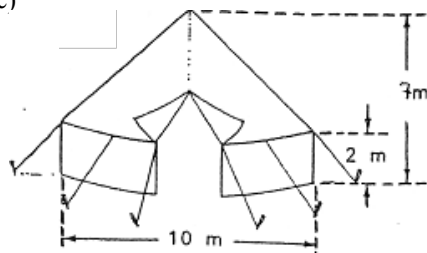
$$r = 6 \text{ cm}$$

$$\begin{aligned} V_{\text{cyl}} &= \pi r^2 h \\ &= \pi (6)^2 (32) \\ &= 3619.1147 \end{aligned}$$

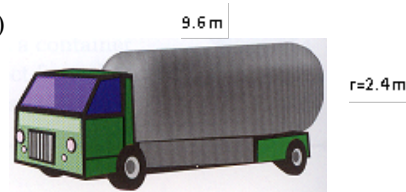
$$\begin{aligned} V_{\text{cone}} &= \frac{1}{3} \pi r^2 h \\ &= \frac{1}{3} \pi (6)^2 (7.5) \\ &= 282.7433 \end{aligned}$$

$$\begin{aligned} V_{\frac{1}{2}\text{sphere}} &= \frac{1}{2} \left(\frac{4}{3} \pi r^3 \right) \\ &= \frac{2}{3} \pi (6)^3 \\ &= 452.3893 \end{aligned}$$

c)

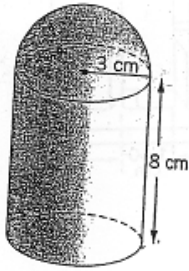


d)

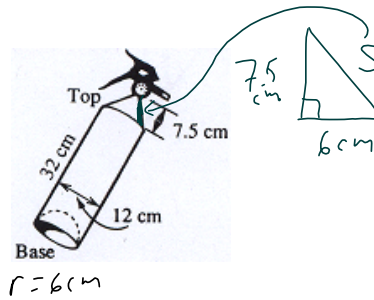


2. Determine the total surface area of each figure.

a)



b)

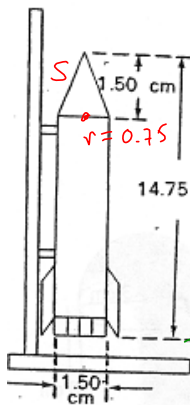


$$\begin{aligned}
 S^2 &= 6^2 + 7.5^2 \\
 &= 36 + 56.25 \\
 &= 92.25 \\
 S &= \sqrt{92.25} \\
 &= 9.6046 \\
 &= 9.605 \text{ cm}
 \end{aligned}$$

$$\begin{aligned}
 SA_{\text{figure}} &= SA_{\text{cyl}} + SA_{\text{cone}} + SA_{\text{sphere}} \\
 &= 2\pi rh + \pi r s + \frac{1}{2}(4\pi r^2) \\
 &= 2\pi(6)(32) + \pi(6)(9.605) + 2\pi(6)^2 \\
 &= 1206.3715 + 18(0.499) + 226.1946 \\
 &= 1613.616 \text{ cm}^2 \\
 &= 1613.616 \text{ cm}^2 \text{ (d)}
 \end{aligned}$$

c)

lateral surface area of cylinder and cone only



$$\begin{aligned}
 S^2 &= 0.75^2 + 1.50^2 \\
 S &= 1.677 \text{ cm}
 \end{aligned}$$

$$\begin{aligned}
 h &= 14.75 - 1.50 \\
 &= 13.25
 \end{aligned}$$

Determine the cost to paint the toy rocket (left), if one container of paint covers 20 cm², and costs \$358 (assume no taxes).

$$\begin{aligned}
 \# \text{ cans} &= \frac{66.39}{20.7} \\
 &= 3.20
 \end{aligned}$$

∴ 4 cans of paint

$$\begin{aligned}
 \text{Cost} &= 4 \times 3.58 \\
 &= \$14.32
 \end{aligned}$$

$$\begin{aligned}
 SA_{\text{fig}} &= SA_{\text{cone}} + SA_{\text{cyl}} + \cancel{\text{Bottom? circle}} \\
 &= \pi r s + 2\pi r h + \cancel{\pi r^2}
 \end{aligned}$$

$$= \pi(0.75)(1.677) + 2\pi(0.75)(13.25) + \cancel{\pi(0.75)^2}$$

$$= 3.9513 + 62.4391$$

$$= 66.390 \text{ cm}^2$$

3. Determine the volume of **wasted space** (air) in a can of tennis balls, if the radius of a tennis ball is 3.5 cm.



4. If the angle between the blades is 118° , and each blade is 32.7 m long,
- determine the area between any two blades
 - determine the length of the arc between any two blades



$$\begin{aligned} a) A_{\text{Sector}} &= \frac{\theta}{360} \pi r^2 \\ &= \frac{118}{360} \cdot \pi (32.7)^2 \\ &= 1101.095 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} b) a &= \frac{\theta}{360} 2\pi r \\ &= \frac{118}{360} \cdot 2\pi (32.7) \\ &= 67.345 \text{ m} \end{aligned}$$

Answers MCT4CI Final Review 7

1a) 1046.096 cm^3 b) 3449.469 cm^3 c) 287.979 cm^3 d) 173.718 cm^3

2a) 235.619 cm^2 b) 1613.610 cm^2 c) 66.391 cm^2 d) \$14.32

3. 269.392 cm^3

4a) 1101.095 m^2 b) 67.345 m