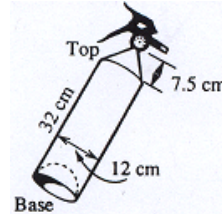
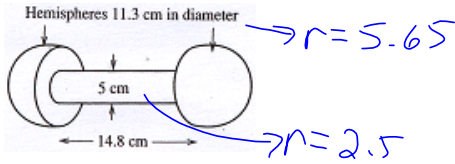


MCT4CI Final Review 7 (updated-Fall 14)

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

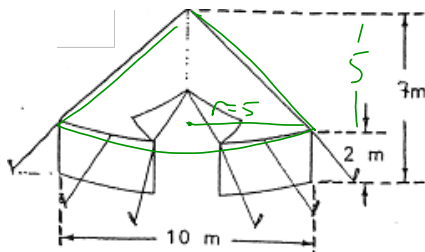
1. Determine the volume of each figure.

a)



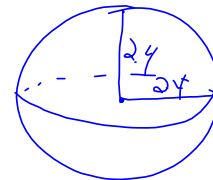
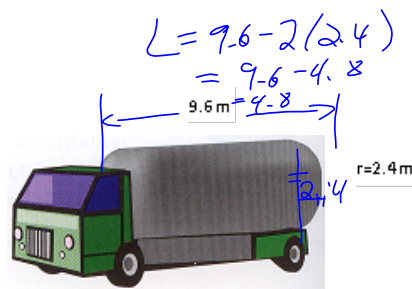
$$\begin{aligned}
 V &= 2 \left( \frac{1}{2} \text{spheres} \right) + \text{Cyl.} \\
 &= 1 \text{ Sphere} + \text{Cyl} \\
 &= \frac{4}{3} \pi r^3 + \pi r^2 h \\
 &= \frac{4}{3} \pi (5.65)^3 + \pi (2.5)^2 (14.8) \\
 &\approx 755.499 + 290.597 \\
 &\approx 1046.096 \text{ cm}^3
 \end{aligned}$$

c)



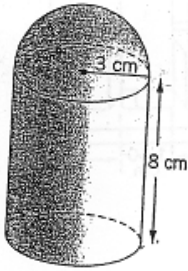
$$\begin{aligned}
 V_{\text{tent}} &= V_{\text{cone}} + V_{\text{cyl}} \\
 &= \frac{1}{3} \pi r^2 h + \pi r^2 h \\
 &= \frac{1}{3} \pi (5)^2 (5) + \pi (5)^2 (2) \\
 &\approx 130.8996 + 157.0796 \\
 &\approx 287.9793 \\
 &\approx 287.979 \text{ m}^3
 \end{aligned}$$

d)

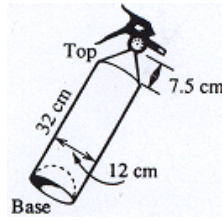


2. Determine the total surface area of each figure.

a)

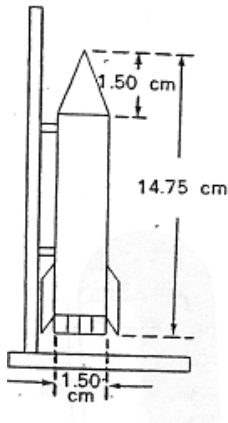


b)



c)

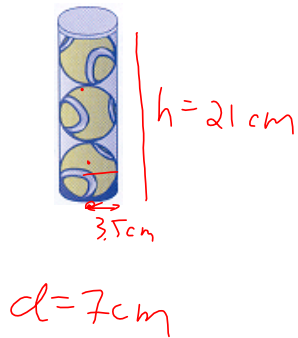
lateral surface area of cylinder and cone only



d)

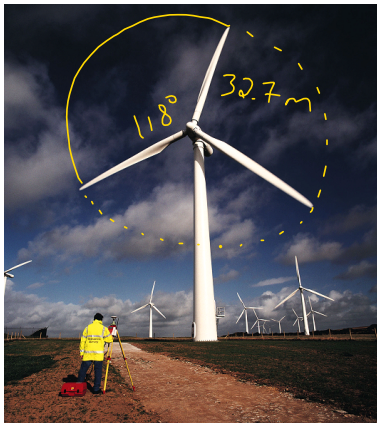
Determine the cost to paint the toy rocket (left), if one container of paint covers  $20 \text{ cm}^2$ , and costs \$358 (assume no taxes).

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.



$$\begin{aligned}
 V_{\text{space}} &= V_{\text{cyl}} - V_{3\text{balls}} \\
 &= \pi r^2 h - 3 \left( \frac{4}{3} \pi r^3 \right) \\
 &= \pi (3.5)^2 (21) - 3 \left( \frac{4}{3} \right) \pi (3.5)^3 \\
 &\doteq 808.1747 - 538.7831 \\
 &\doteq 269.3915 \\
 &\doteq 269.392 \text{ cm}^3
 \end{aligned}$$

4. If the angle between the blades is  $118^\circ$ , 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



$$\begin{aligned}
 A_{\text{Sector}} &= \frac{\theta}{360} \pi r^2 \\
 &= \frac{118}{360} \pi (32.7)^2 \\
 &\doteq 1101.0952 \\
 &\doteq 1101.095 \text{ m}^2
 \end{aligned}$$

$$\begin{aligned}
 a_{\text{length}} &= \frac{\theta}{360} (2\pi r) \\
 &= \frac{118}{360} 2\pi (32.7) \\
 &\doteq 67.3452 \\
 &\doteq 67.345 \text{ m}
 \end{aligned}$$

Answers MCT4CI Final Review 7

1a)  $1046.096 \text{ cm}^3$     b)  $3449.469 \text{ cm}^3$     c)  $287.979 \text{ cm}^3$     d)  $173.718 \text{ cm}^3$

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

3.  $269.392 \text{ cm}^3$

4a)  $1101.095 \text{ m}^2$     b)  $67.345 \text{ m}$