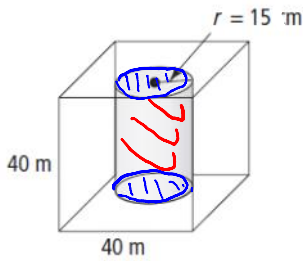


7.4CH Solving Problems Involving Prisms and Cylinders

1. A cylindrical tube is removed from a cube.  
How much volume of the cube is left?



$$V_{\text{CUBE}} - V_{\text{CYLINDER}}$$

$$64000 - \pi(15)^2(40)$$

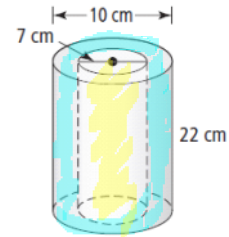
$$64000 - 28260$$

$$\underline{35740 \text{ m}^3}$$

$$SA = 1600\text{m}^2 \times 6 = 9600\text{m}^2$$

$$9600 - 2\pi(15)^2 + 2\pi rh$$

- Kenu puts hot chocolate in a thermos that is 22 cm tall and has a diameter of 10 cm.  
The inside of the thermos has a diameter of 7 cm.  
How much material was used to make the thermos?

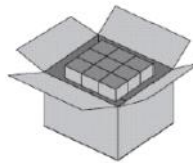


$$V_{\text{BIG}} - V_{\text{small}}$$

What is the capacity of the thermos?

$$\uparrow V_{\text{small}}$$

3. Laura has to pack 60 small boxes into 1 large carton.  
Each small box is 30 cm × 26 cm × 10 cm.  
The large carton is 100 cm × 80 cm × 50 cm.  
Will 60 small boxes fit into the large carton?

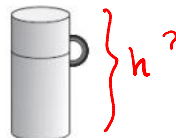


$$V_{\text{large}} = 100 \times 80 \times 50 = 400000 \text{ cm}^3$$

$$V_{\text{small}} = 30 \times 26 \times 10 = 7800 \text{ cm}^3 \times 60 = 468000 \text{ cm}^3$$

Top BIG, Does not fit

4. Tiki wants to get a new thermos for school.  
Her old thermos had a volume of 1570 cm<sup>3</sup>.  
The new thermos has a radius of 5 cm.  
How tall should it be to hold the same amount?



$$V = \pi r^2 h$$

$$\frac{1570}{\cancel{25\pi}} = \frac{\pi \cancel{(5)^2} h}{\cancel{25\pi}}$$

$$20 = h$$

$$\underline{20 \text{ cm}}$$

- b) If her new thermos has a height of 15 cm, what is the radius of the new thermos?

$$\frac{1570}{15\pi} = \frac{\pi r^2 (15)}{15\pi}$$

$$33.33 = r^2$$

$$5.8 = r$$

$$\underline{5.8 \text{ cm}}$$

5. A cylinder has a radius of 40 cm and a height of 45 cm. Another cylinder has the same volume with a radius of 30 cm. What is the height of the second cylinder?

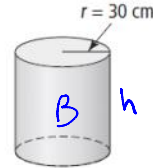
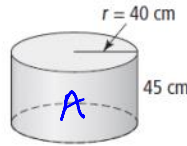
$$V_A = \pi (40)^2 (45) = 72000\pi$$

$$V_B = \pi (30)^2 h$$

note:  $V_A = V_B$

$$\frac{72000\pi}{900\pi} = \frac{\pi (900)h}{900\pi}$$

$$80 = h$$



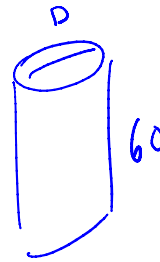
- b) If the other cylinder with the same volume has a height of 60cm, what is the diameter of the second cylinder?

$$\frac{72000\pi}{60\pi} = \frac{\pi r^2 (60)}{60\pi}$$

$$\sqrt{1200} = r$$

$$34.6 = r$$

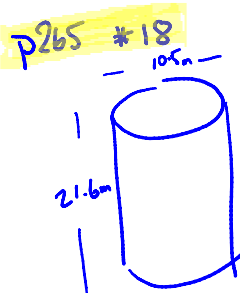
$$\underline{d = 69.3 \text{ cm}}$$



Assignment: p273 #4,7-9,11-15,17-21

\*Careful with #7 the ans is in  $\text{cm}^3$

\*Ans to #13 is 34



$$V_{\text{tank}} = \pi (5.25)^2 (21.6) = 1869.399 \text{ m}^3 = 1869399 \text{ L}$$

$$1 \text{ m}^3 = 1000 \text{ L}$$

We need.... 604 L/person for 10 000 peop.  
 so...  $604 \times 10\,000 = 6\,040\,000 \text{ L needed per day!}$

What fraction of the day do we have?

$$\frac{1870000}{6040000} = \frac{x}{24 \text{ h} \leftarrow \text{whole day.}}$$

$$x \approx 7 \text{ hours}$$