

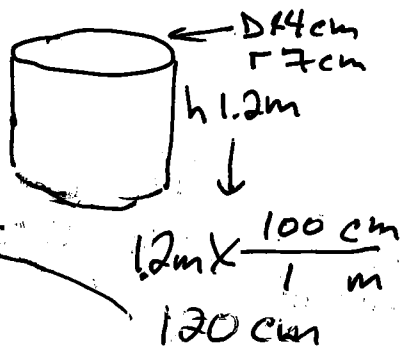
→ COVER → fill  
**SA and Volume Problems**

Name \_\_\_\_\_

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- 1) Jimmy has a stainless steel cylinder. It has a diameter of 14cm and a height of 1.2m. He wants to cover it with decals.

DRAW A PICTURE!



- a. Is this a surface area or volume question?

**SURFACE**

- b. Determine the Surface Area in  $cm^2$

$$SA = 2\pi r^2 + 2\pi r h$$

$$SA = 2\pi(7)^2 + 2\pi(7)(120)$$

$$SA = 307.88 + 5277.88 = \boxed{5585.75}$$

- c. Determine the Surface Area in  $in^2$

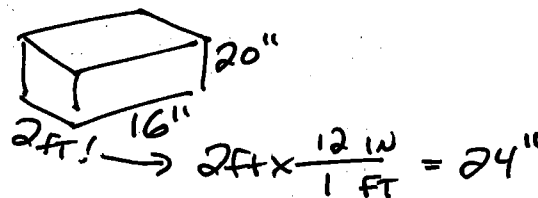
$$5585.75 \text{ cm}^2 \times \frac{1^2 \text{ in}^2}{2.54^2 \text{ cm}^2} = \frac{5585.75}{6.4516} = \boxed{865.79 \text{ in}^2}$$

- d. Each decal covers 8 square inches. How many decals does he need?

$$\frac{865.79}{8} = \boxed{109 \text{ DECALS}}$$

- 2) Jimmy is filling up his rectangular prism fish tank with water. The fish tank has a length of 2 ft, a width of 16 inches, and a height of 20 inches.

- a. Is this a surface area or volume question?



- b. Determine the volume in cubic inches.

$$V = lwh$$

$$V = 24 \cdot 16 \cdot 20 = \boxed{7680 \text{ cu in}}$$

- c. Determine the volume in cubic feet.

$$7680 \text{ in}^3 \times \frac{1^3 \text{ ft}^3}{12^3 \text{ in}^3} = \frac{7680}{1728} = \boxed{4.44 \text{ ft}^3}$$

- d. He is using a cone to fill the tank. He fills the cone at the tap, then pours it into the tank. The cone has a radius of 8cm and a height of 16cm. Determine the volume of the cone in  $cm^3$ .

$$V = \frac{\pi r^2 h}{3} = \frac{\pi(8)^2(16)}{3} = \frac{3216.99}{3} = \boxed{1072.3 \text{ cm}^3}$$

- e. Determine the volume of the cone in  $in^3$ .

$$1072.3 \text{ cm}^3 \times \frac{1^3 \text{ in}^3}{2.54^3 \text{ cm}^3} = \frac{1072.3}{16.39} = \boxed{65.4 \text{ in}^3}$$

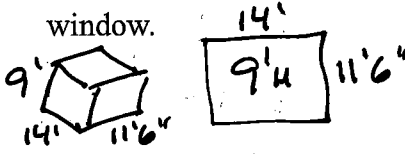
- f. How many trips will he need to make to the tap with the cone to fill the tank entirely?

$$7680 \div 65.4 = 117.4 \text{ TRIPS. Actually } \Rightarrow \boxed{118 \text{ TRIPS}}$$

3) Jimmy is painting the walls of his room. The room is 14' long, 11'6" wide, and 9' high. There is a door that is 7' x 4' and a window that is 3' x 5' that he will not paint.

a. Is this a surface area of volume question?

b. Determine the surface area of the walls of his room in square feet, including the door and window.



$SA = 2(l-h) + 2(w-h)$  NO CEILING OR FLOOR  
 $SA = 2(14 \cdot 9) + 2(11.5 \cdot 9)$   
 $SA = 252 + 207 = \boxed{459 \text{ ft}^2}$

c. Determine the surface area that he needs to paint.

WALLS - DOOR - WINDOW  
 $459 - (7 \times 4) - (3 \times 5)$   
 $459 - 28 - 15 = \boxed{416 \text{ ft}^2}$

d. Jimmy is painting with dollar store tubes that cover  $10 \text{ m}^2$  of wall space. How many square feet does one tube cover?

$$10 \text{ m}^2 \times \frac{1^2 \text{ Ft}^2}{0.3048^2 \text{ m}^2} = \frac{10}{0.0929} = \boxed{107.64 \text{ ft}^2}$$

e. Jimmy is going to do 2 coats of paint. How many tubes does he need?

$$\boxed{\text{Room SA}} \times \boxed{2} \div \boxed{\text{TUBE SA}}$$

$$416 \times 2 \div 107.64 = 7.729$$

$$\boxed{8 \text{ TUBES}}$$