

C: Surface Area

Area Formulas

Rectangle: $A = lw$ Square: $A = s^2$ Triangle: $A = \frac{1}{2}bh$

Circle: $A = \pi r^2$ Parallelogram: $A = bh$

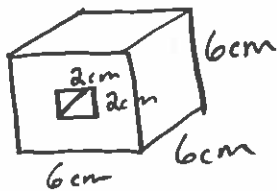
Surface Area

Cylinder: $SA = 2\pi r^2 + 2\pi rh$

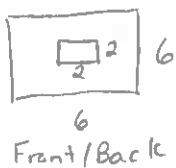
\Rightarrow To find SA find the area of all sides and add them together.

Examples:

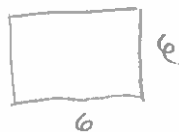
1. Determine the surface area of the following.



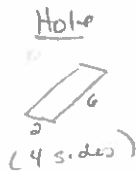
Hole extends through entire block.



Front/Back



Bot/Top/Left/Right



Front/Back

$$\begin{aligned} A &= s^2 - s^2 \\ &= (6)^2 - (2)^2 \\ &= 36 - 4 \\ &= 32 \end{aligned}$$

Bot

$$\begin{aligned} A &= s^2 \\ &= (6)^2 \\ &= 36 \end{aligned}$$

Hole

$$\begin{aligned} A &= lw \\ &= (2 \times 6) \\ &= 12 \end{aligned}$$

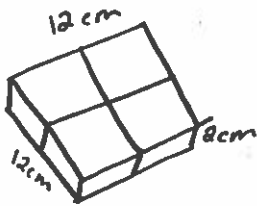
$$SA = 2A_{\text{FRONT}} + 4A_{\text{TOP}} + 4A_{\text{HOLE}}$$

$$= 2(32) + 4(36) + 4(12)$$

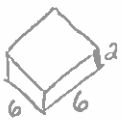
$$= 64 + 144 + 48$$

$$= \boxed{256 \text{ cm}^2}$$

2. 4 small boxes, all the same size are shown below.

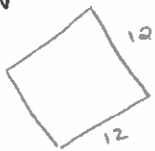


a) What are the dimensions of a single box?



$\Rightarrow 6\text{ cm} \times 6\text{ cm} \times 2\text{ cm}$
width \times length \times height.

b) What is the surface area for the arrangement of the four boxes?



Top/Bottom



4 sides.

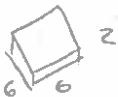
$$\begin{aligned} A_T &= s^2 \\ &= (12)^2 \\ &= 144 \end{aligned}$$

$$\begin{aligned} A_S &= lw \\ &= (12)(2) \\ &= 24 \end{aligned}$$

$$\begin{aligned} SA &= 2A_T + 4A_S \\ &= 2(144) + 4(24) \\ &= 288 + 96 \end{aligned}$$

$$= 384\text{ cm}^2$$

c) What is the ratio of the answer in b to the total surface area of all four boxes?



Top/Bottom



4 sides.

$$A_T = s^2$$

$$= (6)^2$$

$$= 36$$

$$A_{side} = lw$$

$$= (6)(2)$$

$$= 12$$

$$SA = 2A_T + 4A_s$$

$$= 2(36) + 4(12)$$

$$= 72 + 48$$

$$= 120 \text{ cm}^2$$

6 Boxes

$$(120 \text{ cm}^2)(6)$$

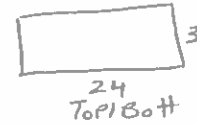
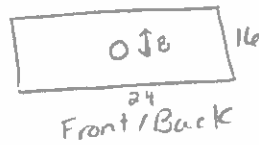
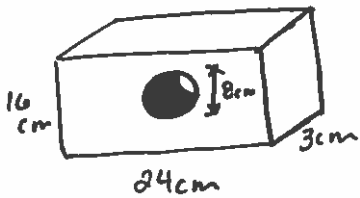
$$= 720 \text{ cm}^2$$

Ratio

$$\frac{385 \text{ cm}^2}{720 \text{ cm}^2}$$

$$= \frac{77}{144}$$

13. Find the surface area. Chlor, Cole



Hole (Cylinder)



$$r = \frac{8}{2} = 4$$

Front

$$A = lw - \pi r^2$$

$$= (24)(16) - (3.14)(4)^2$$

$$= 384 - 50.24$$

$$= 333.76$$

Left

$$A = lw$$

$$= (3)(16)$$

$$= 48$$

Top

$$A = lw$$

$$= (24)(3)$$

$$= 72$$

* Hole ~~no~~ top/bottom

$$SA = \cancel{2\pi r^2} + 2\pi rh$$

$$= 2(3.14)(4)(3)$$

$$= 75.36$$

$$SA = 2A_F + 2A_L + 2A_T + SA_{HOLE}$$

$$= 2(333.76) + 2(48) + 2(72) + 75.36$$

$$= 667.52 + 96 + 144 + 75.36$$

$$= 982.88 \text{ cm}^2$$

Assignment Pg. 32 # 5, 7, 8, 12, 13, 15, 17



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