

10-1B & 10-1C Volume Notes: Prisms, and Cylinders

Volume - the space a three-dimensional figure occupies * units cubed ($\text{in}^3, \text{ft}^3, \text{yd}^3$, etc)

For Prisms and Cylinders

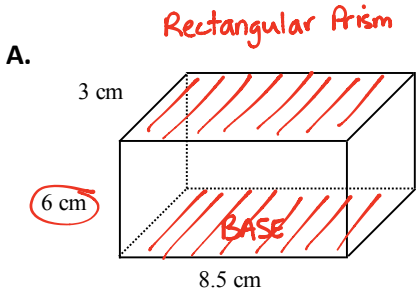
(2 parallel bases, w/rectangles for sides)

$$V = Bh \quad \begin{matrix} h: \text{height of} \\ \text{prism,} \\ \text{cylinder} \end{matrix}$$

$$B: \text{area of base shape}$$

distance between two bases
3 dimensions

Ex. 1: Find the volume of each prism or cylinder. Round to the nearest tenth if necessary.



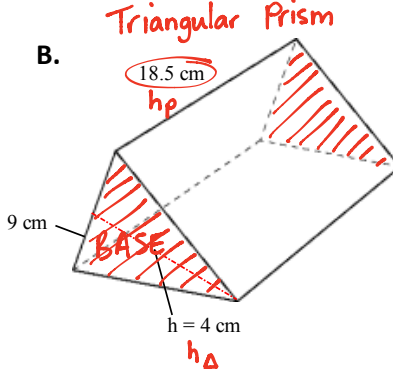
$$V = Bh$$

area of rectangle

$$= (lw)h$$

$$= 3(8.5)(6)$$

$V = 153 \text{ cm}^3$



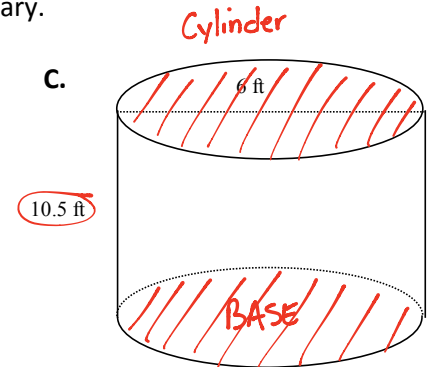
$$V = Bh$$

area of triangle

$$= \left(\frac{bh_{\Delta}}{2}\right)h_p$$

$$= \frac{9(4)}{2} \cdot 18.5$$

$V = 333 \text{ cm}^3$



$$V = Bh$$

area of circle

$$= (\pi r^2)h$$

$$= \pi(3)^2(10.5)$$

$$= \pi(9)(10.5)$$

$$= 94.5(3.14)$$

$V = 296.7 \text{ ft}^3$

Ex. 2: The base of a rectangular box has an area of 18 square feet and a volume of 360 cubic feet.

$$B = 18 \text{ ft}^2 \quad V = 360 \text{ ft}^3 \quad V = Bh$$

A. Write an equation that can be used to find the height of the box.

$$360 = 18h$$

B. Find the height of the box.

$$\frac{360}{18} = \frac{18h}{18}$$

$h = 20 \text{ ft}$

Ex. 3: What is the volume of a cylindrical canister that has a radius of 2 inches and a height of 5 inches? Round to the nearest tenth.

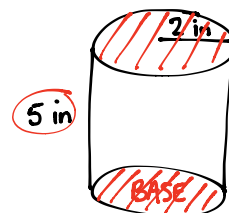
$$V = Bh$$

$$= \pi(2)^2(5)$$

$$= (3.14)(4)(5)$$

$$= (3.14)(20)$$

$V = 62.8 \text{ in}^3$



KEY TIPS:

- 1) Circle (height of figure)
- 2) Shade (bases)
- 3) Name (figure using the shape of the base)
- 4) Write basic formula for 3-D figure
- 5) Write specific formula (according to base)
- 6) Substitute values
- 7) Calculate
- 8) Check units/rounding