Volumes of Prisms and Cylinders

Unit 11 Lesson 4

VOLUMES OF PRISMS AND CYLINDERS

Students will be able to:

Understand how to find the volumes of prisms and cylinders

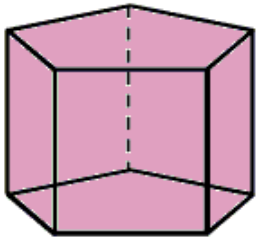
Key Vocabulary:

- Prism
- Cylinder
- Volume of Prism
- Volume of Cylinder

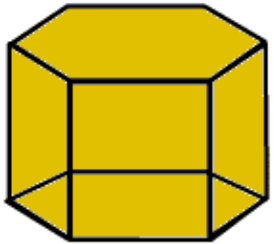
Prism

A prism is a polyhedron with two congruent parallel faces called **bases**. The non-base faces of a prism are called **lateral faces**.

Examples:

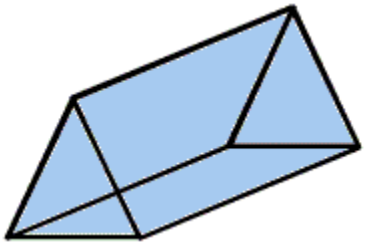


Pentagonal Prism



Hexagonal Prism

Rectangular Prism

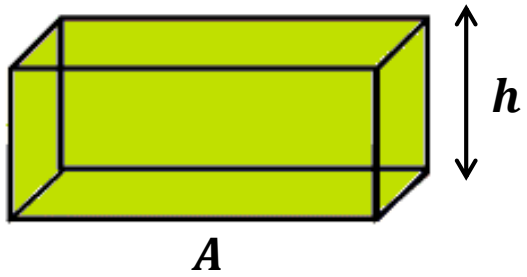


Triangular Prism

Volume of a Prism

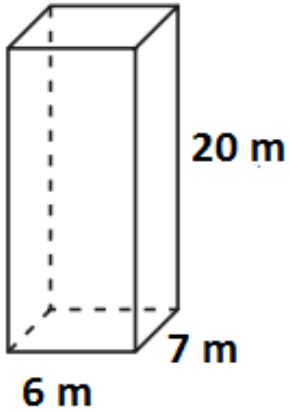
The volume of a prism is the product of the area of the base $\boldsymbol{A}$ and height $\boldsymbol{h}$ of the prism.

$$\boldsymbol{V = A \times h}$$

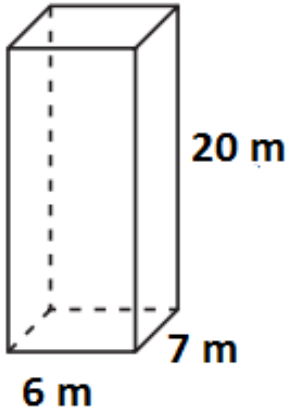


VOLUMES OF PRISMS AND CYLINDERS

Problem 1: Find the volume of the prism shown below.



Problem 1: Find the volume of the prism shown below.



First find the base area of the prism:

$$A = 6m \times 7m$$

$$\Rightarrow \quad A = 42\ m^2$$

Now find the volume:

$$V = A \times h$$

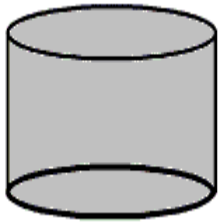
$$V = 42 \times 20$$

$$\Rightarrow \quad V = 840\ m^3$$

Cylinder

A cylinder is like a prism, but with circular bases.

Examples:



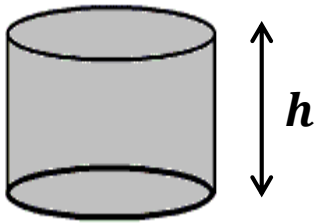
Vertical Cylinder

Horizontal Cylinder

Volume of a Cylinder

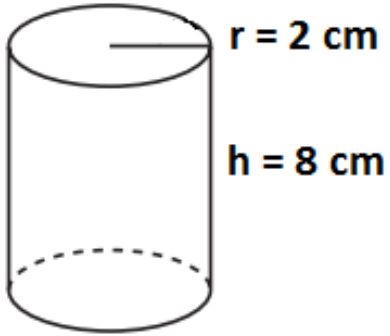
The volume of a cylinder is the product of the area of the circular base $\boldsymbol{A = \pi r^2}$ and height $\boldsymbol{h}$ of the prism.

$$\boldsymbol{V = \pi r^2 \times h}$$

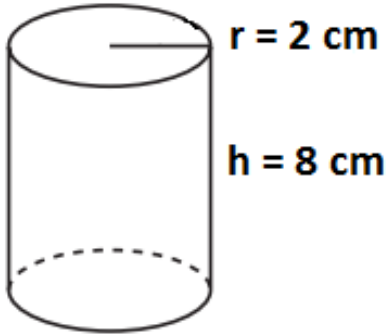


$\boldsymbol{A = \pi r^2}$

Problem 2: Find the volume of the cylinder shown below.



Problem 2: Find the volume of the cylinder shown below.



First find the area of the circular base:

$$A = \pi r^2 \Rightarrow A = \pi(2)^2$$

$$\Rightarrow A = 4\pi\ cm^2$$

Now find the volume:

$$V = A \times h$$

$$V = 4\pi \times 8$$

$$\Rightarrow V = 100.53\ cm^3$$