Chapter 11: Surface Area & Volume

SECTION 2: VOLUME OF PRISMS & CYLINDERS

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I Can

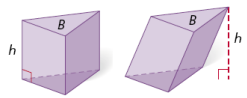
- ❑ Apply the formula for the volume of a prism
- ❑ Apply the formula for the volume of a cylinder

Volume

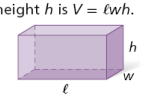
The **volume** of a three-dimensional figure is the number of nonoverlapping unit cubes of a given size that will exactly fill the interior.

Volume of a Prism

The volume of a prism with base area B and height h is $V = Bh$.



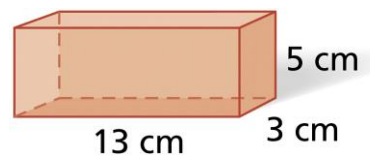
The volume of a right rectangular prism with length ℓ, width w, and height h is $V = \ell wh$.



The volume of a cube with edge length s is $V = s^3$.

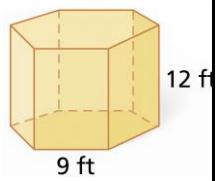
Example

Find the volume of the prism. Round to the nearest tenth, if necessary.



Example

Find the volume of the right regular hexagonal prism. Round to the nearest tenth, if necessary.



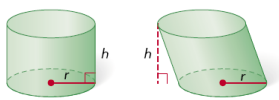
Example

Find the volume of a triangular prism with a height of 9 yd whose base is a right triangle with legs 7 yd and 5 yd long.

Volume of Cylinders

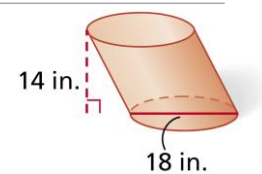
Volume of a Cylinder

The volume of a cylinder with base area B, radius r, and height h is $V = Bh$, or $V = \pi r^2 h$.



Example

Find the volume of the cylinder. Give your answers in terms of π and rounded to the nearest tenth.

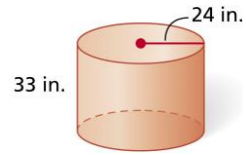


Example

Find the volume of a cylinder with base area 121π cm^2 and a height equal to twice the radius. Give your answer in terms of π and rounded to the nearest tenth.

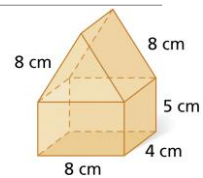
Effects of Changing Dimensions

The radius and height of the cylinder are multiplied by . Describe the effect on the volume.



Composite Figures

Find the volume of the composite figure. Round to the nearest tenth.



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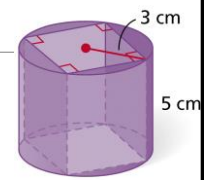
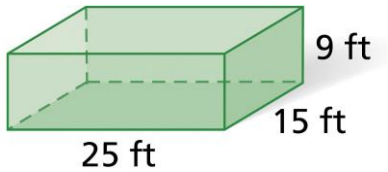


Real World Example

A swimming pool is a rectangular prism. Estimate the volume of water in the pool in gallons when it is completely full (Hint: 1 gallon ≈ 0.134 ft^3). The density of water is about 8.33 pounds per gallon. Estimate the weight of the water in pounds.



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