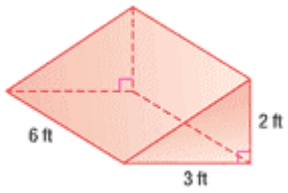
Lesson 11-2

Example 1 Volume of a Rectangular Prism
Find the volume of a rectangular prism having length 12 inches, width 5 inches, and height 3 inches.

$V = Bh$	Formula for volume of a prism
$V = (\ell \cdot w)h$	The base is a rectangle, so $B = \ell \cdot w$.
$V = (12 \cdot 5)3$	$\ell = 12$, $w = 5$, $h = 3$
$V = 180$	Simplify.

The volume is 180 cubic inches.

Example 2 Volume of a Triangular Prism
Find the volume of the triangular prism shown below.



$V = Bh$	Formula for volume of a prism
$V = \left(\frac{1}{2} \cdot 3 \cdot 2\right)h$	B = area of base or $\frac{1}{2} \cdot 3 \cdot 2$
$V = \left(\frac{1}{2} \cdot 3 \cdot 2\right)(6)$	The height of the prism is 6 ft.
$V = 18$	Simplify.

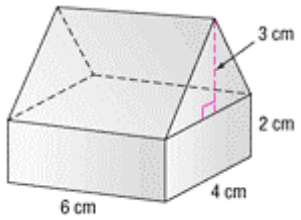
The volume is 18 cubic feet.

Example 3 Height of a Prism
A rectangular prism has length 12 meters, width 7.5 meters and a volume of 405 cubic meters. Find its height.

$V = Bh$	Formula for volume of a prism
$V = \ell \cdot w \cdot h$	Formula for volume of a rectangular prism.
$405 = 12 \cdot 7.5 \cdot h$	Replace V with 405, ℓ with 12 and w with 7.5.
$405 = 90h$	Simplify.
$4.5 = h$	Divide each side by 90.

The height of the prism is 4.5 meters.

Example 4 Volume of a Complex Solid
Multiple-Choice Test Item
Find the volume of the solid at the right.



A. 84 cm^3 **B.** 106 cm^3
C. 36 cm^3 **D.** 148 cm^3

Read the Test Item
The solid is made up of a rectangular prism and a triangular prism. The *volume of the solid* is the sum of both volumes.

Solve the Test Item
Step 1 The volume of the rectangular prism is 6(4)(2) or 48 cubic cm.

Step 2 In the triangular prism, the area of the base is $\frac{1}{2}(4)(3)$, and the height is 6.

Therefore, the volume is $\frac{1}{2}(4)(3)(6)$ or 36 cubic cm.

Step 3 Add the volumes.
48 cubic cm + 36 cubic cm = 84 cubic cm

The answer is A.

Example 5 Volume of a Cylinder
Find the volume of each cylinder. Round to the nearest tenth.
a. radius of base 8 in. and height 20 in.

$V = \pi r^2 h$	Formula for volume of a cylinder
$V = \pi \cdot 8^2 \cdot 20$	Replace r with 8 and h with 20.
$V \approx 4021.2$	Simplify.

The volume is about 4021.2 cubic inches.

b. diameter of base 12.4 cm and height 13.3 cm.

Since the diameter is 12.4 cm, the radius is 6.2 cm.

$V = \pi r^2 h$	Formula for volume of a cylinder
$V = \pi \cdot (6.2)^2 \cdot 13.3$	Replace r with 6.2 and h with 13.3.
$V \approx 1606.1$	Simplify.

The volume is about 1606.1 cubic centimeters.