Lesson 5-7

Example 1

Find the volume of the figure at the right.

Solution

The figure is a prism. To find the volume (V) of any prism, multiply the area of the base (B) by the height (h) of the prism. First find the area of the base, which is a right triangle.

$$B = \frac{1}{2}bh$$
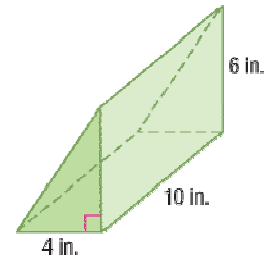
$$B = 1\frac{1}{2}2(4)(6)$$

$$B = 12$$

The area of the base is 12 in^2. Then use the volume formula.
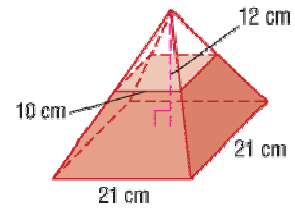
$$V = Bh$$
$$V = (12)(10)$$
$$V = 120$$

The volume is 120 in^3.

Example 2

Find the volume of the shaded part of the figure shown, if the height of the entire pyramid is 20 m.

Solution

To find the volume of the shaded part, find the difference between the volume of the small pyramid and the volume of the large pyramid. To find the volume of any pyramid, multiply $\frac{1}{3}$ of the area of its base (B) by its height (h).

The base of each of these pyramids is a square.

Find the volume of the small pyramid.

$$V = \frac{1}{3}Bh$$

$$V = 1\frac{1}{3}2(10^2)(12)$$

$$V = 400$$

The volume of the large pyramid is 2940 cm^3.

Find the volume of the large pyramid.

$$V = \frac{1}{3}Bh$$

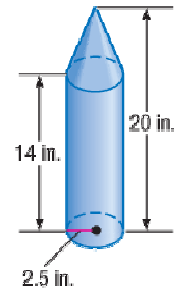$$V = 1\frac{1}{3}2(21^2)(20)$$

$$V = 2940$$

The volume of the small pyramid is 400 cm^3.

2,940-400 = 2,540

The volume of the shaded region is 2,540 cm^3.

Example 3

MANUFACTURING A candy company decides to sell its new
Blast Off candy bars in a package shaped like a rocket. The body
of the rocket is shown at the right. Find the volume of the figure.

Solution

A cylinder and cone combine to form the figure shown. Add the
volume of the cone to the volume of the cylinder.

Find the volume of the cylinder.

$V = \pi r^2 h$
$V = (\pi)(2.5^2)(14)$
$V \quad 274.75$

The volume of the cylinder is
about 275 in³.

Find the volume of the cone.

$V = \frac{1}{3}\pi r^2 h$

$V = 1\frac{1}{3}2(\pi)(2.5^2)(6)$

$V \quad 39.25$

The volume of the cone is
about 39 in³.

The volume of the figure is about 314 in.^3 .

Example 4

ASTRONOMY The diameter of the moon is approximately 2160 mi. What is its volume?

Solution

The moon is a sphere. To find the volume of a sphere, use the formula $V = \frac{4}{3}\pi r^3$.

$V = \frac{4}{3}\pi r^3$

$V \quad \frac{4}{3}(3.14)(1080)^3 \quad 5{,}273{,}994{,}240$

The volume of the moon is approximately 5,273,994,240 mi³.