

**Study Guide and Intervention**

7MG2.1, 7MG2.2

**Area of Complex Figures**

To find the area of a complex figure, separate the figure into shapes whose areas you know how to find. Then find the sum of these areas.

**Example Find the area of the complex figure.**

The figure can be separated into a semicircle and trapezoid.

**Area of semicircle**

$$A = \frac{1}{2}\pi r^2$$

$$A = \frac{1}{2}\pi(7)^2$$

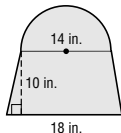
$$A \approx 77.0$$

**Area of trapezoid**

$$A = \frac{1}{2}h(b_1 + b_2)$$

$$A = \frac{1}{2} \cdot 10 \cdot (14 + 18)$$

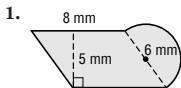
$$A = 160$$



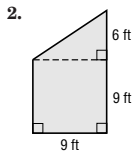
The area of the figure is about  $77.0 + 160$  or 237 square inches.

**Exercises**

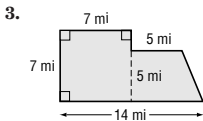
Find the area of each figure. Round to the nearest tenth if necessary.



$$54.1 \text{ mm}^2$$



$$108 \text{ ft}^2$$



$$79 \text{ mi}^2$$

4. What is the area of a figure formed using a triangle with a base of 6 meters and a height of 11 meters and a parallelogram with a base of 6 meters and a height of 11 meters?  $99 \text{ m}^2$
5. What is the area of a figure formed using a semicircle with a diameter of 8 yards and a square with sides of a length of 6 yards?  $61.1 \text{ yd}^2$
6. What is the area of a figure formed using a rectangle with a length of 9 inches and a width of 3 inches and a triangle with a base of 4 inches and a height of 13 inches?  $53 \text{ in}^2$

**Study Guide and Intervention**

7MG2.1, 7MG2.2

**Volume of Prisms and Cylinders**

The volume  $V$  of a prism or a cylinder is the area of the base  $B$  times the height  $h$ , or  $V = Bh$ .

**Example 1** Find the volume of the rectangular prism.

$$V = Bh$$

Volume of a prism

$$V = (\ell \cdot w)h$$

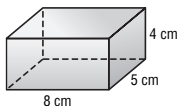
The base is a rectangle, so  $B = \ell \cdot w$ .

$$V = (8 \cdot 5)4$$

 $\ell = 8$ ,  $w = 5$ ,  $h = 4$ 

$$V = 160$$

Simplify.



The volume is 160 cubic centimeters.

The volume  $V$  of a cylinder with radius  $r$  is the area of the base  $B$  times the height  $h$ , or  $V = Bh$ . Since the base is a circle, the volume can also be written as  $V = \pi r^2 h$ , where  $B = \pi r^2$ .

**Example 2** Find the volume of the cylinder. Round to the nearest tenth if necessary.

$$V = \pi r^2 h$$

Volume of a cylinder

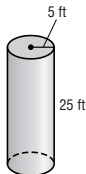
$$V = \pi \cdot 5^2 \cdot 25$$

 $r = 5$ ,  $h = 25$ 

$$V \approx 1,963.5$$

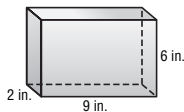
Simplify.

The volume is about 1,963.5 cubic feet.

**Exercises**

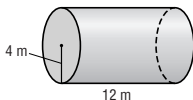
Find the volume of each solid. Round to the nearest tenth if necessary.

1.



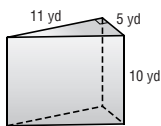
$$108 \text{ in}^3$$

2.



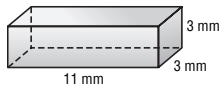
$$603.2 \text{ m}^3$$

3.



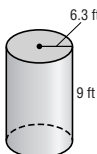
$$275 \text{ yd}^3$$

4.



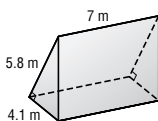
$$99 \text{ mm}^3$$

5.



$$1,122.2 \text{ ft}^3$$

6.



$$83.2 \text{ m}^3$$