

**Study Guide and Intervention**

7MG1.1, 7MG2.4

**Converting Square and Cubic Units of Measure**

Some of the units of area in the customary system are in<sup>2</sup>, ft<sup>2</sup>, yd<sup>2</sup>, and mi<sup>2</sup>.  
Some of the units of area in the metric system are cm<sup>2</sup> and m<sup>2</sup>.

**Example 1** Convert 5 square yards to square feet.

$$\begin{aligned} 5 \text{ yd}^2 &= 5 \cdot \text{yd} \cdot \text{yd} \cdot \frac{3 \text{ ft}}{1 \text{ yd}} \cdot \frac{3 \text{ ft}}{1 \text{ yd}} \\ &= 45 \text{ ft}^2 \end{aligned}$$

**Example 2** Convert 2.5 square meters to square centimeters.

$$\begin{aligned} 2.5 \text{ m}^2 &= 2.5 \cdot \text{m} \cdot \text{m} \cdot \frac{100 \text{ cm}}{1 \text{ m}} \cdot \frac{100 \text{ cm}}{1 \text{ m}} \\ &= 25,000 \text{ cm}^2 \end{aligned}$$

Some of the units of volume in the customary system are in<sup>3</sup>, ft<sup>3</sup>, yd<sup>3</sup>, and mi<sup>3</sup>.  
Some of the units of volume in the metric system are cm<sup>3</sup> and m<sup>3</sup>.

**Example 3** Convert 1,500 cubic centimeters to cubic meters.

$$\begin{aligned} 1,500 \text{ cm}^3 &= 1,500 \cdot \text{cm} \cdot \text{cm} \cdot \text{cm} \cdot \frac{1 \text{ m}}{100 \text{ cm}} \cdot \frac{1 \text{ m}}{100 \text{ cm}} \cdot \frac{1 \text{ m}}{100 \text{ cm}} \\ &= \frac{1,500 \text{ m}^3}{1,000,000} \\ &= \frac{65,000 \text{ m}}{2,237.04 \text{ sec}} \\ &= 0.0015 \text{ m}^3 \end{aligned}$$

**Convert 30 square feet to square meters.**

$$\begin{aligned} 30 \text{ ft}^2 &= 30 \cdot \text{ft} \cdot \text{ft} \cdot \frac{0.3048 \text{ m}}{1 \text{ ft}} \cdot \frac{0.3048 \text{ m}}{1 \text{ ft}} \\ &\approx 2.79 \text{ m}^2 \end{aligned}$$

**Example 4** Complete each conversion. Round to the nearest hundredth if necessary.

1.  $6 \text{ ft}^2 = \blacksquare \text{ in}^2$  **864**      2.  $0.25 \text{ m}^2 = \blacksquare \text{ cm}^2$  **2,500**      3.  $18 \text{ ft}^2 = \blacksquare \text{ yd}^2$  **2**  
 4.  $189 \text{ ft}^3 = \blacksquare \text{ yd}^3$  **7**      5.  $2 \text{ m}^3 = \blacksquare \text{ cm}^3$  **2,000,000**      6.  $3,456 \text{ in}^3 = \blacksquare \text{ ft}^3$  **2**  
 7.  $24 \text{ cm}^2 \approx \blacksquare \text{ in}^2$  **3.72**      8.  $15 \text{ ft}^3 \approx \blacksquare \text{ m}^3$  **0.42**      9.  $7 \text{ in}^3 \approx \blacksquare \text{ cm}^3$  **114.71**