## Using and Evaluating Formulas

A **formula** is an equation that relates one quantity to one or more other quantities. For instance, the area of a rectangle is given by the formula

$$\text{Area} = (\text{base})(\text{height}) \quad \text{or} \quad A = bh.$$

### Common Area Formulas

Square: "side squared"

$A = s^2$

$s$

$s$
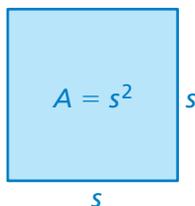
Rectangle: "base times height"

$A = bh$

$h$

$b$

Triangle: "one-half base times height"

$h$

$A = \frac{1}{2}bh$

$b$

Circle: "pi times radius squared"

$r$

$A = \pi r^2$

$\pi \approx 3.14$

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**Study Tip**

Another formula for the area of a rectangle is "length times width."

$A = \ell w$

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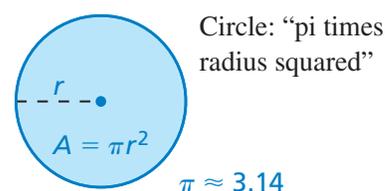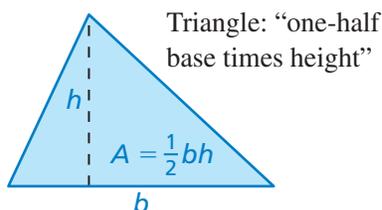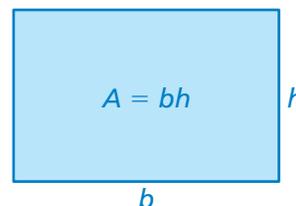
**EXAMPLE 4**  **Buying Floor Tiles**

You are buying tiles for your kitchen floor. The room is 8 feet by 12 feet. The tiles are 12-inch squares that cost $8.97 each. The tiles come in boxes of 15. You should order an extra 20 tiles to allow for waste.

**a.** How many boxes should you order?

**b.** What is the total cost of your order?

### SOLUTION

**a.** The area of the room is $8 \times 12$, or 96 square feet. So, you need 96 tiles plus an extra 20 tiles for waste. This is a total of 116 tiles. Because there are 15 tiles in a box, you should order 8 boxes, giving you 120 tiles.

**b.** The total cost of your order is

Number of tiles    Cost per tile

$$120 \times 8.97 = \$1076.40.$$

12 in.

12 in.

Ceramic tile has been around for at least 4000 years. Tiled surfaces have been found in the ruins of Egypt, Babylon, and Greece.

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You are buying tiles for 2 bathroom floors. One room is 8.5 feet by 8.5 feet. The other room is 9 feet by 10 feet. The tiles are 12-inch squares that cost $7.65 each. The tiles come in boxes of 12. You order an extra 20 tiles to allow for waste.

**c.** How many boxes should you order?

**d.** What is the total cost of your order?