**1.2 Applications and Modeling with Linear Equations**

**Solving Applied Problems**

**Solving an Applied Problem**

***Step 1*** **Read** the problem carefully until you understand what is given and what is to be found.

***Step 2*** **Assign a variable** to represent the unknown value, using diagrams or tables as needed. Write down what the variable represents. If necessary, express any other unknown values in terms of the variable.

***Step 3*** **Write an equation** using the variable expressions(s).

***Step 4*** **Solve** the equation.

***Step 5*** **State the answer** to the problem. Does it seem reasonable?

***Step 6*** **Check** the answer in the words of the original problem.

**CLASSROOM EXAMPLE 1 Finding the Dimensions of a Square**

The length of a rectangle is 2 in. more than the width. If the length and width are each increased by 3 in., the perimeter of the new rectangle will be 4 in. less than 8 times the width of the original rectangle. Find the dimensions of the original rectangle.

**CLASSROOM EXAMPLE 2 Solving a Motion Problem**

Krissa drove to her grandmother’s house for a weekend visit. She averaged 40 mph driving there on Friday. As she returned home on Sunday, traffic was lighter, so she was able to average 48 mph, and her driving time was 1 hr less. What is the distance between Krissa’s home and that of her grandmother?

**CLASSROOM EXAMPLE 3 Solving a Mixture Problem**

How many liters of a 25% antifreeze solution should be added to 5 L of a 10% solution to obtain a 15% solution?

**CLASSROOM EXAMPLE 4 Solving an Investment Problem**

Last year, Owen earned a total of $784 in interest from two investments. He invested a total of $28,000, part of it at 2.4% and the rest at 3.1%. How much did he invest at each rate?

**CLASSROOM EXAMPLE 5 Modeling Prevention of Indoor Pollutants**

If a vented range hood removes contaminants such as carbon monoxide and nitrogen dioxide from the air at a rate of *F* liters of air per second, then the percent *P* of contaminants that are also removed from the surrounding air can be modeled by the linear equation



What flow *F* (to the nearest hundredth) must a range hood have to remove 70% of the contaminants from the air?