Lesson Summary

In many word problems, an equation is often formed by setting an expression equal to a number. To build the expression, it is helpful to consider a few numerical calculations with just numbers first. For example, if a pound of apples costs \$2, then three pounds cost \$6 (2×3), four pounds cost \$8 (2×4), and n pounds cost $2n$ dollars. If we had \$15 to spend on apples and wanted to know how many pounds we could buy, we can use the expression $2n$ to write an equation, $2n = 15$, which can then be used to find the answer: $7\frac{1}{2}$ pounds.

To determine if a number is a solution to an equation, substitute the number into the equation for the variable (letter) and check to see if the resulting number sentence is true. If it is true, then the number is a solution to the equation. For example, $7\frac{1}{2}$ is a solution to $2n = 15$ because $2\left(7\frac{1}{2}\right) = 15$.

Problem Set

1. Check whether the given value is a solution to the equation.
   a. $4n - 3 = -2n + 9 \qquad n = 2$
   b. $9m - 19 = 3m + 1 \qquad m = \frac{10}{3}$
   c. $3(y + 8) = 2y - 6 \qquad y = 30$

2. Tell whether each number is a solution to the problem modeled by the following equation.
   Mystery Number: Five more than -8 times a number is 29. What is the number?
   Let the mystery number be represented by n.
   The equation is $5 + (-8)n = 29$.
   a. Is 3 a solution to the equation? Why or why not?
   b. Is -4 a solution to the equation? Why or why not?
   c. Is -3 a solution to the equation? Why or why not?
   d. What is the mystery number?

3. The sum of three consecutive integers is 36.
   a. Find the smallest integer using a tape diagram.
   b. Let n represent the smallest integer. Write an equation that can be used to find the smallest integer.
   c. Determine if each value of n below is a solution to the equation in part (b).
      $n = 12.5$
      $n = 12$
      $n = 11$

4. Andrew is trying to create a number puzzle for his younger sister to solve. He challenges his sister to find the mystery number. "When 4 is subtracted from half of a number the result is 5." The equation to represent the mystery number is $\frac{1}{2}m - 4 = 5$. Andrew's sister tries to guess the mystery number.

   a. Her first guess is 30. Is she correct? Why or why not?

   b. Her second guess is 2. Is she correct? Why or why not?

   c. Her final guess is $4\frac{1}{2}$. Is she correct? Why or why not?