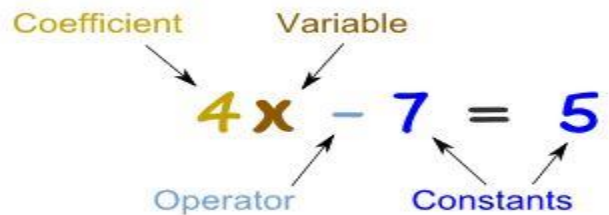# Using Equations

Objective: You will learn what an equation is, if an equation is true or false, and how to write an equation.

Terms:

Equation – is a mathematical sentence that uses an equal sign, =, to show that two expressions are equal. An equation can be either true or false.

To determine whether or not an equation is true or false, substitute the given value with the variable and solve. To be a true equation, both sides of the equal sign must show an equal value; if not, the equation is false.

Example #1: $8 + r = 17$, r = 9
       The equation is read: "$8 + r = 17$. Is this true when $r = 9$?"
       The answer is: **TRUE**

Example #2: $16 - x = 7$, x = 12

The equation is read: "$16 - x = 7$. Is this true when $x = 12$?"
       The answer is: **FALSE**

To write an equation, follow the steps used to write an expression. Remember to include an equal sign in your equation to show that two expressions are equal.

Example #1: Nate scored 8 points in his basketball game. His teammates scored a total of p points, and the team as a whole scored 41 points. Write an equation to represent this situation.

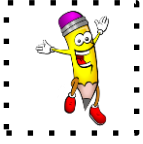| Nate's points | + | Teammates' points | = | Total points |

Step #1: Determine the operation: _____

Step #2: Assign a variable to the unknown value:

Step #3: Translate the verbal model into an equation:

Example #2: Marissa had *f* oranges and gave 1 to Byron. She had 3 oranges left.

Step #1: Determine the operation: _____

Step #2: Assign a variable to the unknown value:

Step #3: Translate the verbal model into an equation:

Example #3: Nick bought 12 snacks and shared them equally among *p* people. Each person got 3 snacks.

Step #1: Determine the operation: _____

Step #2: Assign a variable to the unknown value:

Step #3: Translate the verbal model into an equation:

A. Is the equation true for the given value of the variable? *Show all work*.

    1. $w - 23 = 2, w = 19$

    2. $5h = 25, h = 5$

    3. $y \div 12 = 2, \ y = 24$

B. Write an equation to represent each story problem.

1. Harrison has a fish tank that contains 28 fish in total. There are 9 goldfish and f other fish.

2. Keri went shopping at the Natick Mall. She started with d dollars, and she spent \$43. Keri has \$17 left.

3. Mr. Nickerson split his gym students, s, into volleyball teams of 6 each. He created 12 teams.

4. Mrs. Doolan bought a new big box of markers for her class. The box has 15 markers each of c colors. In total the box has 180 markers.