# Variables

**Variable**: A variable is a letter that represents a variety of numbers.

Algebra is the branch of mathematics where operations are done on variables and numbers.

The following types of problems use variables:
1. Evaluating an expression given values for variables.
2. Simplifying an expression containing variables.
3. Solving equations containing variables.

## 1. Evaluating an expression given values for variables.

**Steps to Evaluate an Expression by Substituting in Values for Variables.**
1. W.O.P. (Note: Make sure the problem has the word, *Evaluate*, an expression, the word *for* or *when*, the variable(s), and the value(s) of the variable(s).

      Example: Evaluate $3x^2 - 5$ for $x = 2$.

2. Substitute in the value for each variable and make sure you use a $( \ )$. If $( \ )$ exist in the expression, change those $( \ )$ to $[ \ ]$.

3. Simplify expression using the order of operations.

Examples:

1. Evaluate $3x^2 - 5$ for $x = 2$.

$$3x^2 - 5 = 3(2)^2 - 5$$
$$= 3(4) - 5$$
$$= 12 - 5$$
$$= 7$$

$$\boxed{\begin{aligned}(2)^2 &= (2)(2) \\ &= 4\end{aligned}}$$

2. Evaluate $a(2c - d)$ for $a = 2$, $c = -3$, and $d = -4$.

$$a(2c - d) = (2)\big[2(-3) - (-4)\big]$$
$$= (2)\big[-6 - (-4)\big]$$
$$= (2)\big[-6 + 4\big]$$
$$= (2)\big[-2\big]$$
$$= -4$$