Mathematics is ruled by the **order of operations**. All operations in mathematics are governed by this order. When simplifying, you must follow the order below:

1. **Parentheses and other grouping symbols**
   a. Innermost grouping symbols first
   b. For fractions, simplify the numerator and denominator separately!
2. **Exponential Expressions**
3. **Multiplication/Division in order from left to right**
4. **Addition/Subtraction in order from left to right**

**Example 1:** Simplify the following.

   a) \((-3)^2\)

   b) \(-3^2\)

**Algebraic Expressions**

- ________: a symbol used to represent an unknown quantity
- ________: a symbol which has a fixed value
- ________: constant or product of a constant and variables raised to some power

An **algebraic expression** is a collection of terms, operation symbols, and grouping symbols. When values are assigned to any involved variables in the expression, we can ________ the expression to find its numerical value.

**Numerical coefficient:**

<table>
<thead>
<tr>
<th>Term</th>
<th>Numerical Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3x^2y</td>
<td></td>
</tr>
<tr>
<td>r</td>
<td></td>
</tr>
<tr>
<td>-x</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>(a^2)</td>
<td></td>
</tr>
<tr>
<td>(\frac{6}{6})</td>
<td></td>
</tr>
<tr>
<td>-(\frac{y}{4})</td>
<td></td>
</tr>
</tbody>
</table>
Like terms:

*Example 2:* Determine if the following terms are like or unlike.

- \(2.3x^2y,\ 4x^2y\)
- \(xy,\ xy^2\)
- \(8abc^2,\ 8ab^2c\)
- \(-5,\ 4\)
- \(\frac{x}{7},\ -2x\)
- \(9rs,\ 10sr\)

To **evaluate** an expression we substitute any given values for the specified variables.

*Example 3:* Find the value of \(5x + 2y\) if \(x = 4\) and \(y = 6\).

**Recall:** The **distributive property**.

\[a(b + c) = ab + ac\quad\text{OR}\quad(b + c)a = ba + ca\]

We can use the distributive property to simplify algebraic expressions by ___________________________________.

When you are combining like terms, you operate on the coefficients only!!!

*Example 4:* Simplify the following expressions.

a) \(-1.5x^2 + 3 + 2.5x^2 + 4x\)

b) \(5(a - 4b) - 2(a - b)\)

c) \(\frac{x}{2} - 2x\)