

## EXPRESSION SIMPLIFICATION

To simplify an expression, combine common terms. The following properties can be used to help:

**Example:** Simplify  $x^3 + 4x + 3(x^3 + 5)$   
 $x^3 + 4x + 3x^3 + 15$   
 $4x^3 + 4x + 15$

Property	Addition	Multiplication
Identity	$a + 0 = a = 0 + a$	$a \cdot 1 = a = 1 \cdot a$
Commutative	$a + b = b + a$	$ab = ba$
Associative	$a + (b + c) = (a + b) + c$	$(ab)c = a(bc)$
Distributive		$a(b + c) = ab + ac$

**degree:** exponent of the variable **Example:**  $8x^3$  has a degree of 3

**coefficient:** number before the variable; if no number, the coefficient is 1

**Example 1:** The coefficient of  $4x$  is 4

**Example 2:** The coefficient of  $x$  is 1

## EQUATION EVALUATION

1. Simplify the expressions.
2. Add or subtract on both sides to get the variable term on just one side.
3. Simplify the expression.
4. Divide both sides by the variable's coefficient.

**Example:** Solve for  $x$

$$2(x + 2) = 8$$

$$2x + 4 = 8$$

simplify (distributive property)

$$2x + 4 - 4 = 8 - 4$$

subtract 4 from both sides

$$\frac{2x}{2} = \frac{4}{2}$$

divide both sides by 2

$$x = 2$$