Lesson 12

Foundations of College Algebra

# Commutative and Associative Properties

## Definition - Commutative Property

* If are real numbers, then .
* If are real numbers, then .

## Definition - Associative Property

* If are real numbers, then .
* If are real numbers, then .

## Examples

Use a commutative property to finish each statement.

Use the associative property to simplify.

# Distributive Property

## Definition - Distributive Property

If are real numbers, then and .

## Examples

Simplify using the distributive property.

Use the distributive property to write each addition as a multiplication.

# Identity and Inverse Properties

## Definition - Identity Property

For any real number , and .

## Definition - Inverse Property

* For any real number , .
* For any real number except , .

## Examples

Simplify.

# Terms

## Definition - Terms and Coefficients

A **term** is a constant, or the product of a constant and one or more variables.

Some terms are: , , , ,and .

The constant that multiplies the variable is called the **coefficient**.

## Note

* The coefficient of is .
* The coefficient of is .

## Definition - Like Terms

Terms that are either constants or have the same variables raised to the same powers are called **like terms**.

## Example

Identify the like terms in the following. 1. , , , , ,

# Combine Like Terms

## How To - Combine Like Terms

1. Identify like terms.
2. Rearrange the expression so like terms are together.
3. Add or subtract the coefficients and keep the same variable for each group of like terms.

## Examples

Simplify the expressions by combining like terms.

1. 10a + 7 + 5a - 2 + 7a - 4$

# Simplify Expressions with Parentheses

## Examples

Simplify using the distributive property.

# Write Word Phrases and Algebraic Expressions

## Examples

Write each phrase in algebra. Use for the unknown number. Simplify the expression if possible.

1. The difference of a number and three, divided by two
2. Four times the sum of a number and twelve.

**Reference**  
Remixed from OpenStax Elementary Algebra 2e. Access for free at <https://openstax.org/books/elementary-algebra-2e/pages/1-introduction>