Topic 3 L. 1: Writing and Expanding Multiplication Expressions

Student Outcomes

* Students will identify parts of an expression using mathematical terms for multiplication. They view one or more parts of an expression as a single entity.

Warm-Up

The operation of multiplication can be written a few different ways. Write the four different ways we can represent the multiplication operation.

1. A X B 2. A \* B 3. (a)(b) 4. ab

**Guided Practice**

Teacher Notes

* When writing expressions using the fewest number of symbols, we will have to refrain from using the symbols , , or .
* We will also be using math terms to describe expressions and the parts of an expression. We will be using words like factor, product, quotient, coefficient, and term.
* A term is a part of an expression that can be added to or subtracted from the rest of the expression. In the expression , what are examples of terms?
  + *, , and are all terms.*
* A coefficient is a constant factor in a variable term. For example, in the term , is the coefficient, and it is multiplied with .
* A variable is a value that can change

By combing like terms we write each expression using the fewest number of symbols and characters. Use math terms to describe the expressions and parts of the expressions. This is called standard form.

, the is the coefficient and a factor, the is the variable and a factor. We can call the product, and we can also call it a term.

, the is the coefficient and a factor, the is the variable and a factor. We can call the product, and we can also call it a term.

, is the coefficient and a factor; and are both variables and factors, and is the product and also a term.

Teacher Note: Variables always follow the numbers and should be written in alphabetical order. Apply this knowledge to the examples below.

, is the coefficient and factor; and are the variables and factors; is the product and also a term.

Teacher Note: If it is helpful, you can gather the numbers together and the variables together. You can do this because of the **commutative property of multiplication**.

or, and are the variables and factors, is the coefficient and factor if it is included, and is the product and also a term.

Explain to students…What happens when you multiply by ?

* + *Multiplying by is an example of the identity property. Any number times is equal to that number. Therefore, we don’t always need to write the one because .*

To expand multiplication expressions, we will rewrite the expressions by including the “” back into the expressions. This is called expanded form.

or

or

1. Find the product of .

1. Multiply .
2. Double the product of and .

* What does it mean to double something?
  + It means to multiply by .

Lesson Summary

An Expression in Expanded Form: An expressionthat is written as sums (and/or differences) of products whose factors are numbers, variables, or variables raised to whole number powers is said to be in *expanded form*. A single number, variable, or a single product of numbers and/or variables is also considered to be in expanded form.

**AN EXPRESSION IN STANDARD FORM:** An expression that is in expanded form where all like-terms have been collected is said to be in *standard form.*

Homework

1. Rewrite the expression in standard form (use the fewest number of symbols and characters possible).
2. Write the following expressions in expanded form.

or

or

1. Find the product.

Optional Extra Practice Activity

Students will be matching expressions on a BINGO board. Some of the expressions will be simplified, and some will be expanded. To save time, provide students with a BINGO board with some of the squares already filled in. Have the remaining answers written on a smart board, chalkboard, or overhead projector so that students can randomly place them on the BINGO board. If there is not enough time for the BINGO game, you can also use these questions on white boards, chalkboards, or some form of personal boards.

Here are the clues to be given during the game, followed by the answers that will be on the board.

**Questions/Clues Answers**

3. Has a coefficient of

These answers have already been included on pre-made BINGO boards to save time. The other answers can be randomly placed in the remaining spaces.

8. Has a coefficient of






16. Has a coefficient of


20. Has a coefficient of

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |