Name_____   Date_____

Properties of Multiplication: Commutative and Associative

There are rules regarding multiplication. Some of these rules are called properties of multiplication. Properties of multiplication are always true. There are different names for different properties of multiplication.

The Commutative Property of Multiplication

The Commutative Property of Multiplication states that factors can be multiplied in any order without the product changing.

For example, saying that 3 x 4 = 12 is the same as saying 4 x 3 = 12. The Commutative Property of Multiplication tells us that the product will always be 12, no matter what order these two numbers are multiplied in. In other words, 3 x 4 = 4 x 3.

This property becomes even more useful when multiplying a longer series of numbers. For example:

$$6 \text{ x } 3 \text{ x } 5 = 90$$

In the above example, a person is multiplying 18 x 5. Some may be able to more quickly multiply the numbers by re-writing them as:

$$5 \text{ x } 3 \text{ x } 6 = 90$$

The above may be easier to multiply because some may find it easier to multiply 15 x 6. This property allows a person to multiply the number in whatever order is easiest for them.

The Associative Property of Multiplication

The Associative Property of Multiplication tells us that factors can be grouped in any way without changing the product.

For example, saying (2 x 3) x 6 = 36 is the same as saying 2 x (3 x 6) = 36. The Associative Property of Multiplication tells us that the product of these numbers will always be 36, no matter which of the numbers are in parentheses.

In other words, (2 x 3) x 6 = 2 x (3 x 6).

The Commutative Property of Multiplication and the Associated Property of Multiplication are very similar. The difference between the two is that the Associated Property deals with multiplication when parentheses are present.

Properties of Multiplication: Commutative and Associative Questions

Which Property of Multiplication is Being Used:

_____ 1. 3 x 1 = 1 x 3

_____ 2. 4 x 2 x 8 = 8 x 4 x 2

_____ 3. 1 x (9 x 5) = (1 x 9) x 5

_____ 4. 12 x 7 x 2 = 2 x 7 x 12

_____ 5. (2 x 5) x 6 = 2 x (5 x 6)

Multiple Choice:

6. All of the following are examples of the Commutative Property of Multiplication EXCEPT:

        a. 5 x 2 x 6 = 6 x 2 x 5
        b. 8 x (1 x 3) = (8 x 1) x 3
        c. 4 x 6 = 6 x 4
        d. 1 x 7 x 6 = 7 x 6 x 1

7. All of the following are examples of the Associative Property of Multiplication EXCEPT:

        a. (8 x 4) x 7 = 8 x (4 x 7)
        b. 6 x (3 x 3) = (6 x 3) x 3
        c. (4 x 4) x 4 = 4 x (4 x 4)
        d. 5 x 9 x 6 = 5 x 6 x 9

True or False:

_____ 8. The Associative Property of Multiplication tells us that factors can be grouped in any way without changing the product.

_____ 9. Properties of multiplication are not always true.

_____10. The Commutative Property of Multiplication states that factors can be grouped in any way without changing the product.

Name_____   Date_____

Properties of Multiplication: Commutative and Associative Answers

Which Property of Multiplication is Being Used:

_ Commutative _____ 1. 3 x 1 = 1 x 3

_ Commutative _____ 2. 4 x 2 x 8 = 8 x 4 x 2

_ Associative_____ 3. 1 x (9 x 5) = (1 x 9) x 5

_ Commutative _____ 4. 12 x 7 x 2 = 2 x 7 x 12

_ Associative_____ 5. (2 x 5) x 6 = 2 x (5 x 6)

Multiple Choice:

6. All of the following are examples of the Commutative Property of Multiplication EXCEPT:

        a. 5 x 2 x 6 = 6 x 2 x 5
        b. 8 x (1 x 3) = (8 x 1) x 3
        c. 4 x 6 = 6 x 4
        d. 1 x 7 x 6 = 7 x 6 x 1

7. All of the following are examples of the Associative Property of Multiplication EXCEPT:

        a. (8 x 4) x 7 = 8 x (4 x 7)
        b. 6 x (3 x 3) = (6 x 3) x 3
        c. (4 x 4) x 4 = 4 x (4 x 4)
        d. 5 x 9 x 6 = 5 x 6 x 9

True or False:

_T___ 8. The Associative Property of Multiplication tells us that factors can be grouped in any way without changing the product.

_F___ 9. Properties of multiplication are not always true.

_T___10. The Commutative Property of Multiplication states that factors can be grouped in any way without changing the product.