Commutative property

The commutative property is something you've been aware of for a long time. You probably just didn't know its proper name. It states that you can add or multiply numbers in any order. For example: $2 + 5 = 5 + 2$.

Commutative Property of Addition	$a + b = b + a$
Commutative Property of Multiplication	$a \cdot b = b \cdot a$

Commutative comes from the word "commute" as in "the morning commute." Since commute means to move you can remember that, when using the commutative property, the numbers will move around.

Example

Use the commutative property to write the expression a different way. Don't perform the multiplication.

$$(5 \cdot 3) \cdot 2$$

We know that when apply the commutative property of multiplication, the numbers move and the parentheses can stay the same. So we could move the numbers to rewrite $(5 \cdot 3) \cdot 2$ as:

$$(3 \cdot 2) \cdot 5$$

Some other options include

$(3 \cdot 5) \cdot 2$

$(2 \cdot 3) \cdot 5$

$(2 \cdot 5) \cdot 3$

$(5 \cdot 2) \cdot 3$

We didn't have to perform the multiplication to solve this problem, but we can also see that the two expressions are equal.

$(5 \cdot 3) \cdot 2 = (3 \cdot 2) \cdot 5$

$(15) \cdot 2 = (6) \cdot 5$

$30 = 30$

Let's try another example with the commutative property of addition.

Example

Is the equation below true or false? Explain your reasoning.

$$4 + 12 + 7 = 7 + 4 + 12$$

True, because of the commutative property of addition. We know it's the commutative property of addition since the order of the numbers changed.

Also we can see that both the right and left side simplify to 23.

$$(4 + 12) + 7 = (7 + 4) + 12$$

$$16 + 7 = 11 + 12$$

$$23 = 23$$
