Associative property

Did you know that when you add or multiply real numbers it doesn't matter how those numbers are grouped, and that the answer will always be the same? You probably already knew this, but now you're learning to explain your reasoning in math, and that's where the term "associative property" will come in handy.

Associative Property of Addition	$(a+b)+c=a+(b+c)$
Associative Property of Multiplication	$(a \cdot b) \cdot c=a \cdot (b \cdot c)$

Associative comes from the word "associate". Try to remember that "associate", in terms of math, refers to grouping with parentheses. In other words, in an example of the associative property, the numbers will stay in the same order, but the parentheses will move.

Example

Use the associative property to write the expression a different way. Don't perform the addition.

$$3+(6+7)$$

We know that when we apply the associative property for addition, the parentheses move, but the numbers don't. So we could keep the numbers where they are, but move the parentheses to rewrite $3+(6+7)$ as

$$(3+6)+7$$

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

$$3 + (6 + 7) = (3 + 6) + 7$$

$$3 + (13) = (9) + 7$$

$$16 = 16$$

Let's try another example with the associative property for multiplication.

Example

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

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

True, because of the associative property of multiplication. The order of the numbers stayed the same while the parentheses moved.

Also we can see that the both the right and left side simplify to 30.

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

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

$$30 = 30$$
