

Math 208 ALEKS RED Properties of real numbers

In this concept, you will be working with 10 properties of real numbers:

1. Commutative Property of Addition
2. Associative Property of Addition
3. Additive Identity Property
4. Additive Inverse Property
5. Distributive Property
6. Commutative Property of Multiplication
7. Associative Property of Multiplication
8. Multiplicative Identity Property
9. Multiplication Property of Zero

You will be given four or five true statements and asked to identify which of the 10 properties applies to this statement. **Keep the following chart handy:**

	PROPERTIES OF ADDITION	PROPERTIES OF MULTIPLICATION
Commutative (order)	$x + y = y + x$	$x \cdot y = y \cdot x$ or $xy = yx$
Associative (grouping)	$(x + y) + z = x + (y + z)$	$(x \cdot y) \cdot z = x \cdot (y \cdot z)$ or $(xy)z = x(yz)$
Identity (returns itself)	$x + 0 = x$ or $0 + x = x$	$x \cdot 1 = x$ or $1 \cdot x = x$
Inverse (opposite \rightarrow 0 or 1)	$x + (-x) = 0$ or $-x + x = 0$	$x \cdot \frac{1}{x} = 1$ or $\frac{1}{x} \cdot x = 1$
Distributive (\cdot through $+$)	$x(y + z) = xy + xz$ or $(x + y)z = xz + yz$	
Multiplicative Property of Zero (multiply by 0 = 0)	$0 \cdot x = 0$ or $x \cdot 0 = 0$	

Now, let's look at the chart and try to understand what it is telling us:

Commutative: In both cases (addition and multiplication), you have two numbers. **The order of the numbers switches.** This property tells us that it doesn't matter if we add 3 to 4 or add 4 to 3, the answer is the same. This property tells us that it doesn't matter if we multiply 3 times 4 or multiply 4 times 3, the answer is the same.

Associative: In both cases (addition and multiplication), you have three numbers. The order of the numbers remains the same. **The parenthesis move to form different groups.** This property tells us that if we have three numbers to add (or to multiply), we can do the first two numbers first then the third number, or we can do the last two numbers first then the first one.