Algebra 1 CC – Unit 1
Lesson 2: Properties of the Real Number System

Name: _____
Date: _____

The properties of the Real Number System will prove useful when working with _____, _____ and _____ in Algebra, as they allow for the creation of equivalent expressions, which will often aid in solving problems. In addition, they can be used to help _____or _____ solutions.

Let's check out the different properties together:

PEMDAS

	Property (a, b and c are real numbers, variables or algebraic expressions)	Examples	Verbal hints
1.	Distributive Property $a \cdot (b + c) = a \cdot b + a \cdot c$	$1 \cdot (2+3) = 1 \cdot 2 + 1 \cdot 3$	"multiplication distributes across addition"
2.	Commutative Property of Addition $a + b = b + a$	$1 + 2 = 2 + 1$	"commute – to get up and move to a new location : switch places"
3.	Commutative Property of Multiplication $a \cdot b = b \cdot a$	$3 \cdot 2 = 2 \cdot 3$	"commute – to get up and move to a new location: switch places"
4. +	Associative Property of Addition $a + (b + c) = (a + b) + c$	$2 + (6+7) = (2+6) + 7$	"regroup - elements do not physically move, they simply group with a new friend."
5. ×	Associative Property of Multiplication $a \cdot (b \cdot c) = (a \cdot b) \cdot c$	$7 \cdot (13 \cdot 17) = (7 \cdot 13) \cdot 17$	"regroup - elements do not physically move, they simply group with a new friend."
6.	Additive Identity Property $a + 0 = a$	$2 + 0 = 2$	"the value that returns the input unchanged"
7.	Multiplicative Identity Property $a \cdot 1 = a$	$8 \cdot 1 = 8$	"the value that returns the input unchanged"
8.	Additive Inverse Property $a + (-a) = 0$ opposite	$8 + (-8) = 0$	"the value that brings you back to the identity element under addition"
9.	Multiplicative Inverse Property $a \cdot \left(\frac{1}{a}\right) = 1$ where $a \neq 0$		"the value that brings you back to the identity element under multiplication"
10.	Zero Property of Multiplication $a \cdot 0 = 0$		"zero times any value is 0"

Properties…Definitions!

1. Distributive Property _____

2. Commutative Property of Addition _____

3. Commutative Property of Multiplication _____

4. Associative Property of Addition _____

5. Associative Property of Multiplication _____

6. Additive Identity Property _____

7. Multiplicative Identity Property _____

8. Additive Inverse Property _____

9. Multiplicative Inverse Property _____

10. Zero Property of Multiplication _____