

# ***Associative Property of Addition***

**When three or more numbers are added, the sum is the same regardless of the grouping of the addends.**

**For example  $(a + b) + c = a + (b + c)$**

# ***Associative Property of Multiplication***

**When three or more numbers are multiplied, the product is the same regardless of the order of the multiplicands.**

**For example  $(a \times b) \times c = a \times (b \times c)$**

# ***Commutative Property of Addition***

**When two numbers are added, the sum is the same regardless of the order of the addends.**

**For example  $a + b = b + a$**

# **Commutative Property of Multiplication**

**When two numbers are multiplied together, the product is the same regardless of the order of the multiplicands.**

**For example  $a \times b = b \times a$**

# ***Distributive Property***

**The sum of two numbers times a third number is equal to the sum of each addend times the third number.**

**For example  $a \times (b + c) = a \times b + a \times c$**

# ***Identity Property of Addition***

**The sum of any number and zero is the original number.**

**For example  $a + 0 = a$**

# ***Identity Property of Multiplication***

**The product of any number and one is that number.**

**For example  $a \times 1 = a$**

# ***Additive Inverse of a Number***

**The additive inverse of a number,  
a is -a so that  $a + -a = 0$**



# ***Multiplicative Inverse of a Number***

**The multiplicative inverse of  
a number,  $\frac{1}{a}$  so that  $a \times \frac{1}{a} = 1$ .**

# ***Multiplication Property of Zero***

**Multiplying any number by 0 yields 0.**

**For example  $a \times 0 = 0$ .**

## ***Property of Equality***

**The equals sign in an equation is like a scale:**

**both sides, left and right, must be the same in order for the scale to stay in balance and the equation to be true.**

# ***Property of Equality for Addition***

**Property of Equality for Addition says that  
if  $a = b$ , then  $a + c = b + c$ .**

**If you add the same number to both sides  
of an equation, the equation is still true.**

## ***Property of Equality for Subtraction***

**Property of Equality for Subtraction says  
that if  $a = b$ , then  $a - c = b - c$ .**

**If you subtract the same number from  
both sides of an equation, the equation is  
still true.**

# ***Property of Equality for Multiplication***

**Property of Equality for Multiplication  
says that if  $a = b$ , then  $a \times c = b \times c$ .**

**If you multiply the same number to both  
sides of an equation, the equation is still  
true.**

# ***Property of Equality for Division***

**Property of Equality for Division says that  
if  $a = b$ , then  $a / c = b / c$ .**

**If you divide the same number to both  
sides of an equation, the equation is still  
true.**

# Real Numbers

**I**

Irrational

Non-terminating  
decimal  
with no pattern

$\pi$

$e$   
 $\sqrt{2}$

1.24519764...

**Q**

Rational

Can be represented as a fraction (ratio)

$\frac{1}{4}$

$\sqrt{9}$

0

**Z**

Integers

All whole #s and their opposites

... -2, -1, 0, 1, 2, ...

.9999999...

3.57

**W**

Whole

All Natural #s and zero.

0, 1, 2, ...

**N**

Natural

The counting numbers

1, 2, 3, ...