***The properties of EQUALITY Name:***

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Property says any number is equal to itself! $3=3$

More examples:

The \_\_\_\_\_\_\_\_\_\_­­­­\_\_\_\_\_\_\_\_\_\_Property says that if two things are equal then it doesn’t matter which side of the equal sign they are on. $2+3=5 and 5=2+3$

More examples:

The \_\_\_\_\_\_\_\_\_\_­­­­\_\_\_\_\_\_\_\_\_\_Property says that if one quantity equals a second, and that second quantity equals a third, then the first one also equals the third!

$$If a=b and b=c then a=c$$

More examples:

*The Substitution Property says that a quantity can be \_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_ by its equal value in ANY expression.*

$$If n=11, then 4n=4(11)$$

More examples:

*We use the above properties so much we often don’t even think about them!*

*THE* ***COMMUTATIVE*** *PROPERTY OF ADDITION*

*You can change the \_\_\_\_\_\_\_\_\_\_\_\_ of two terms in addition.*

*(Be careful with subtraction – if you always change subtraction it to adding a negative it will still work!)*

Example: $2+3=3+2$ Example: $x+y=y+x$

Example: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Example: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Rewrite these using the commutative property of addition:

1. $2x+3y+z=$*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*
2. $4+\left(-3\right)+8=$*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

*THE* ***COMMUTATIVE*** *PROPERTY OF MULTIPLICATION*

*You can change the \_\_\_\_\_\_\_\_\_\_\_\_ of two \_\_\_\_\_\_\_\_\_ in multiplication.*

*Absolutely DOES NOT work with division!*

Example: $2∙3=3∙2$ Example: $xy=yx$

Example: *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

Example:­*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

Rewrite these using the commutative property of multiplication:

1. $9∙m∙n=$*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*
2. $2x+3xy+mnk=$*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

Explain what property is being used, or why it does not work.

1. $4+5∙2=5∙2+4$
2. $4+2∙5=4+5∙2$
3. $4∙2∙5=4+2+5$
4. $4∙2+5=4∙5+2$

*THE* ***ASSOCIATIVE*** *PROPERTY OF ADDITION*

*You can ­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_­­\_\_ three or more terms in addition.*

*This does not work for \_­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

Example: $2+\left(3+5\right)=\left(2+3\right)+5$ Example: $\left(x+y\right)+z=x+(y+z)$

Example: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Example: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

NON-EXAMPLE:

Rewrite these using the associative property of addition. Hint: Copy them down in the same order and then put the parenthesis in a different place!

1. $(2x+3y)+z=$*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*
2. $(4+\left(-3\right))+8=$*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

*THE* ***ASSOCIATIVE*** *PROPERTY OF MULTIPLICATION*

*You can \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ three or more factors in multiplication.*

*This does not work for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

Example: $2∙\left(3∙5\right)=\left(2∙3\right)∙5$ Example: $\left(x∙y\right)∙z=x∙(y∙z)$

Example: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Example: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

NON-EXAMPLE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Rewrite these using the associative property of multiplication. Hint: Copy them down in the same order and then put the parenthesis in a different place!

1. $(2x∙3y)∙z=$*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*
2. $(4∙\left(-3\right))∙8=$*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*
3. $x\left(yz\right)=$*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

*THE* ***ADDITIVE IDENTITY***

An identity for a particular operation **doesn’t change** the identity of **the number** when the operation is done.

You can add \_\_\_\_\_\_\_ to any \_\_\_\_\_\_\_\_\_ and you will get the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_!

Example:

*THE* ***MULTIPLICATIVE IDENTITY***

An identity for a particular operation **doesn’t change** the identity of **the number** when the operation is done.

You can multiply any number by \_\_\_\_\_\_\_ and you will get the original \_\_\_\_\_\_\_\_.

Example:

*THE* ***ZERO*** *PROPERTY OF MULTIPLICATION*

When any number is multiplied with zero, the answer is \_\_\_\_\_\_\_\_\_.

Example:

*THE* ***ADDITIVE INVERSE***

The number you \_\_\_\_\_\_\_\_ to get to \_\_\_\_\_\_\_\_.

AKA: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Example:

*THE* ***MULTIPLICATIVE INVERSE***

The number you \_\_\_\_\_\_\_\_ to get to \_\_\_\_\_\_\_\_.

AKA: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Example:

*THE* ***DISTRIBUTIVE PROPERTY*** *– THIS BOTH ADDITION AND MULTIPLICATION!*

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a sum by some number is the same as multiplying \_\_\_\_\_\_\_\_\_\_\_ by that same number.

Example: