*I can **identify number properties.***

Number Properties Reference Guide

Commutative Property of Addition Definition: Numbers can be added in any order and get the same sum. Numbers Example: $5+2=7$ $2+5=7$ Algebra Example: $a+b=c$ $b+a=c$	**Associative Property of Addition** Definition: Numbers being added can be grouped in any way and get the same sum Numbers Example: $(1+2)+3=6$ $1+(2+3)=6$ Algebra Example: $(a+b)+c=d$ $a+(b+c)=d$	**Identity Property of Addition** Definition: The sum of any number and 0 is that number Numbers Example: $5+0=5$ $-8+0=-8$ Algebra Example: $a+0=a$ $b+0=b$
Commutative Property of Multiplication Definition: Numbers can be multiplied in any order and get the same answer Numbers Example: $2\cdot5=10$ $5\cdot2=10$ Algebra Example: $ab=c$ $ba=c$	**Associative Property of Multiplication** Definition: Numbers being multiplied can be grouped in any way and get the same answer Numbers Example: $(2\cdot3)\cdot4=24$ $2\cdot(3\cdot4)=24$ Algebra Example: $(a\cdot b)\cdot c=d$ $a\cdot(b\cdot c)=d$	**Identity Property of Multiplication** Definition: The product of any number and 1 is that number Numbers Example: $5\cdot1=5$ $-8\cdot1=-8$ Algebra Example: $a\cdot1=a$ $b\cdot1=b$
Distributive Property Definition: Multiplying a sum by a number is the same as multiplying by each addend Numbers Example: $2(3+4)=2(3)+2(4)$ Algebra Example: $a(b+c)=ab+ac$	**Additive Inverse Property** Definition: The sum of any number and its opposite is 0 Numbers Example: $5+(-5)=0$ $-8+8=0$ Algebra Example: $a+(-a)=0$ $-b+b=0$	**Multiplicative Inverse Property** Definition: The product of a number and its reciprocal is 1 Numbers Example: $5\cdot\frac{1}{5}=1$ $10\cdot\frac{1}{10}=1$ Algebra Example: $a\cdot\frac{1}{a}=1$ $b\cdot\frac{1}{b}=1$
Zero Product Property Definition: If the product of two numbers is 0, one of the numbers must be zero	Numbers Example: $5\cdot0=0$ $-8\cdot0=0$	Algebra Example: $a\cdot b=0$ a and/or $b=0$

I can ***apply number properties.***

Why do we use number properties?

With Numbers: To solve problems quickly and mentally

With Variables: To represent all expressions

Examples:

1) How can you use a property to solve this problem in your head?

15(2·9)

Which property did you use?

$(15 \cdot 2) \cdot 9 = 30 \cdot 9 = 270$

Associative

2) How can you use a property to solve this problem in your head?

-6 + 72 + (-14) + 8

Which property did you use?

$-6 + (-14) + 72 + 8$

$-20 + 80 = 60$

Commutative

3) Use TWO properties to help solve the problem.

$(-3 \cdot 4)(\frac{1}{4} \cdot -\frac{1}{3})$

Which properties?

$-3 \cdot -\frac{1}{3} \cdot 4 \cdot \frac{1}{4}$

$1 \cdot 1 = 1$

Associative & Mult. Inverse

4) Use TWO properties to help solve the problem.

-3.85 + 18.21 + 3.85

Which properties?

$-3.85 + 3.85 + 18.21$

$0 + 18.21 = 18.21$

Commutative & Add. Inverse

Examples:

5) $-2.12 + (-42.18) + 2.12$

Which properties?

$0 + (-42.18) = -42.18$

Commutative

6) $-2 + (5 + 3) + (2 + -3)$

Which properties?

$0 + 0 + 5 = 5$

Associative

Add. Inverse

7) $-9 \cdot (5 \cdot \frac{1}{9})(6 \cdot -\frac{1}{5})$

Which properties?

$-1 \cdot -1 \cdot 6 = 6$

Associative

&

Mult. Inverse

8) $(-2 + 5) + 2 + 3(1) + 3(0)$

Which properties?

$0 + 5 + 3 + 0 = 8$

Associative

Identity

Zero