## Properties of Addition and Multiplication

Commutative Property of Addition:
Words: Changing the order of the addends does not change the sum.
Numbers: $5+8=8+5$
Algebra: $\quad a+b=b+a$

## Commutative Property of Multiplication:

Words: Changing the order of the factors does not change the product.
Numbers: $5 \cdot 8=8 \cdot 5$
Algebra: $a \cdot b=b \cdot a$

## Associative Property of Addition:

Words: Changing the grouping of the addends does not change the sum.
Numbers: $(7+4)+2=7+(4+2)$
Algebra: $\quad(a+b)+c=a+(b+c)$

## Associative Property of Multiplication:

Words: Changing the grouping of the factors does not change the product.
Numbers: $(7 \cdot 4) \cdot 2=7 \cdot(4 \cdot 2) \quad$ Algebra: $(a \cdot b) \cdot c=a \cdot(b \cdot c)$

Addition Property of Zero: (also called the Identity Property of Addition)
Words: The sum of any number and 0 is that number.
Numbers: $7+0=0$
Algebra: $\quad a+0=a$

## Multiplication Property of Zero:

Words: The product of any number and 0 is zero.
Numbers: $9 \cdot 0=0$
Algebra: $\quad a \cdot 0=0$

Multiplication Property of One: (also called the Identity Property of Multiplication)
Words: The product of any number and 1 is that number.
Numbers: $4 \cdot 1=4$
Algebra: $\quad a \cdot 1=a$

