

Commutative Property

Commutative Property of Addition:

the **order** that the **numbers** are added does **not** change the **sum**.

$$3 + 5 = 5 + 3$$

$$a + b = b + a$$

$$2\frac{2}{3} + 4\frac{1}{7} + 7 = 7 + 2\frac{2}{3} + 4\frac{1}{7}$$

$$a + b + c = c + b + a$$

Commutative Property of Multiplication:

the **order** of the **factors** does **not** change the **product**.

$$2 \cdot 6 = 6 \cdot 2$$

$$a \cdot b = b \cdot a$$

$$3 \cdot 4 \cdot 5 = 5 \cdot 4 \cdot 3$$

$$a \cdot b \cdot c = c \cdot b \cdot a$$

Commutate means to TRAVEL.

* It doesn't matter where the #'s travel to the answer is the same!

Associative Property

Associative Property of Addition:

$$(2 + 4^3) + 7 = 2 + (4^3 + 7)$$

the way the numbers are grouped does not change the sum.

$$(a + b) + c = a + (b + c)$$

Associative Property of Multiplication:

$$(3\frac{2}{3} \cdot 4) \cdot 5 = 3\frac{2}{3} \cdot (4 \cdot 5)$$

the way the factors are grouped does not change the product.

$$(a \cdot b) \cdot c = a \cdot (b \cdot c)$$

Associate means to TALK!

It doesn't matter what group the #'s "TALK" in - the answer is still the same!

Distributive Property

Distributive Property of Multiplication and Addition:

The numbers can be **added** and then **multiplied** to get a **product** or the numbers can be **multiplied** separately and then **add** the **products**.

$$2 \cdot 7\frac{3}{5} = 2 \cdot (7 + \frac{3}{5}) = (2 \cdot 7) + (2 \cdot \frac{3}{5})$$

$$a \cdot (b + c) = (a \cdot b) + (a \cdot c)$$

Distributive Property of Multiplication and Subtraction:

The numbers can be **subtracted** and then **multiplied** to get a **product** or the numbers can be **multiplied** separately and then **subtract** the **products**.

$$2 \cdot 27 = 2 \cdot (30 - 3) = (2 \cdot 30) - (2 \cdot 3)$$

$$a \cdot (b - c) = (a \cdot b) - (a \cdot c)$$

Identity Property of Addition

Identity Property of Addition:	$4\frac{11}{14} + 0 = 4\frac{11}{14}$
the sum of any number and zero is that number.	$n + 0 = n$

Identity Property of Multiplication

Identity Property of Multiplication:	
the product of any number and one is that number.	$8 \cdot 1 = 8$
	$n^4 \cdot 1 = n^4$

Zero Property of Multiplication

Zero Property of Multiplication:	
the product of any number and zero is zero.	$179 \cdot 0 = 0$
	$0 \cdot p = 0$