

## Symbols Books 7 and 8

- + 1. The sign used to show addition.  
It is called a **plus sign (pluhss)**.  
(1 + 2 equals 3.)  
(You say “one plus two equals three”)
2. The sign used to show a **positive number**. (+4 is said, “positive four” or “plus four.”)
- 1. The sign used to show subtraction.  
It is called a **minus sign (mye-nuhss)**.  
(5 – 1 equals 4.)  
(You say “five minus one equals four.”)
2. The sign used to show a **negative number**. (–3 is said, “negative three” or “minus three.”)
- a negative sign. Sometimes this shorter line is used to show a negative number. (examples: -4, -5 versus the longer line –4, –5)
- × times symbol. This shows multiplication.  
Example:  $4 \times 5$  means you multiply 4 times 5.
- ÷ divided by symbol. This shows division.  
Example:  $10 \div 2$  means you take 10 divided by 2.
- fraction line.
1. shows division.  
Example:  $\frac{20}{5}$  means 20 divided by 5
2. shows a fraction  
Example:  $\frac{2}{7}$  means the fraction two sevenths

- This is a fraction line (**frak-shuhn line**). The line between two numbers or expressions of a fraction shows division.

Examples:  $\frac{10}{2}$  shows 10 divided by 2.

$\frac{3+2}{4+1}$  shows 3 + 2 divided by 4 + 1 .

- ( ) These symbols are called parentheses. They are used to enclose numbers and/or symbols in math.

Parentheses (puh-**ren**-thuh-seez) means two or more of these symbols ( ).

Parenthesis (puh-**ren**-thuh-siss) means one of these symbols ( ).

They show multiplication if there is no other operation symbol between a number and a parenthesis. Example: 3(4) means 3 times 4. Or 3(1 + 5) means 3 times what is in the parentheses.

- ( ) parentheses.

1. These show multiplication when next to other parentheses or when next to a number.

Examples: (4)(5) means 4 times 5  
3 (7) means 3 times 7

2. They can be used to more clearly show a positive or negative integer together with its sign.

Examples: (-2) means negative 2  
(+9) means positive 9

3. parentheses group numbers and/or symbols.

Examples: (4 + 5)  
2(3 + 5 - 1)

- [ ] These symbols are called brackets (**brak-it**). These are used sometimes when you have parentheses within parentheses.

Example: (3 + 2(4 + 1)) can also be written [3 + 2(4 + 1)] .

= This is an equal sign. It means “is equal to”, or “equals”.  
Example:  $2 + 2 = 4$  means 2 plus 2 equals 4  
or 2 plus 2 is equal to 4.

$6^2$  the two is an exponent and means squared.

$5^3$  the three is an exponent and means cubed

$2^4$  any small number written to the upper right corner of a number is an exponent. ( For  $2^4$  you say 2 to the 4<sup>th</sup> power.)

$\theta$  is the Greek letter theta

$\alpha$  is the Greek letter alpha

## Summary of Properties.

### PROPERTIES OF ADDITION

#### Commutative Property of Addition

The order in which numbers are added does not change their sum.

$$7 + 3 = 10 \text{ is the same as } 3 + 7 = 10$$

$$\text{or you could say } 7 + 3 = 3 + 7$$

#### Associative Property of Addition

The way three or more numbers are grouped does not change their sum.

$$(2 + 3) + 4 = 9 \text{ is the same as } 2 + (3 + 4) = 9$$

$$\text{or you could say } (2 + 3) + 4 = 2 + (3 + 4)$$

#### Additive Identity of Addition

A number plus zero is always that number.

$$8 + 0 = 8 \quad -6 + 0 = -6$$

#### Property of Opposites ( also called Additive Inverse Property)

A number and its opposite equal 0.

$$-2 + 2 = 0 \quad \text{or} \quad (-7) + 7 = 0 \quad 9 + (-9) = 0$$

### PROPERTIES OF MULTIPLICATION

#### Commutative Property of Multiplication

The order that numbers are multiplied does not change the product.

$$2 \times 3 = 3 \times 2 \quad \text{or} \quad 4 \times 5 \times 6 = 6 \times 5 \times 4$$

#### Associative Property of Multiplication

The way three or more numbers are grouped does not change the product.

$$2 \times (3 \times 4) = 24 \quad \text{or} \quad (2 \times 3) \times 4 = 24$$

$$\text{or you could say } 2 \times (3 \times 4) = (2 \times 3) \times 4$$

#### Multiplicative Identity Property

Any number multiplied by one, is that number.

$$6 \times 1 = 6 \quad (-5) \times 1 = -5$$

**Property of Reciprocals ( also called Multiplicative Inverse Property)**

A number times its reciprocal is 1.

$$4 \times \frac{1}{4} = 1 \quad \text{or} \quad 5 \times \frac{1}{5} = 1$$

**Zero Property of Multiplication**

A number times zero is equal to zero.

$$3 \times 0 = 0 \quad (\text{Also zero divided by a number is zero. } 0 \div 3 = 0 \text{ or } \frac{0}{5} = 0 .)$$

$$-4 \times 0 = 0$$

**DISTRIBUTIVE PROPERTY****Distributive Property**

Each integer inside the parenthesis must be multiplied by the integer in front of the parentheses.

$$\begin{array}{ll} 2(3 + 4) & -3(2 + 5) \\ 2 \times 3 + 2 \times 4 & (-3)(2) + (-3)(5) \end{array}$$

**DIVIDING BY ZERO RULE**

Dividing by zero is undefined. ( Remember: zero divided by a number is zero.  $0 \div 7 = 0$  . See Zero Property of Multiplication above.)

$$3 \div 0 = \text{undefined} \quad \text{or} \quad \frac{3}{0} \text{ is undefined}$$

$$-8 \div 0 = \text{undefined} \quad \text{or} \quad \frac{-8}{0} \text{ is undefined}$$

## PROPERTIES OF EQUALITY

These properties say that in order to keep an equation equal on both sides, if you do something to one side you must do it to the other.

Addition Property of Equality – if you add a number to one side of an equation, you must add the same number to the other side.

Subtraction Property of Equality – if you subtract a number from one side of an equation, you must subtract the same number from the other side.

Multiplication Property of Equality – if you multiply one side of an equation by a number, you must multiply the other side by the same number.

Division Property of Equality – if you divide one side of an equation by a number, you must divide the other side by the same number.