SET OF REAL NUMBERS

Real Numbers are the numbers we use every day. All real numbers can be plotted on a number line.

Whole Numbers {0, 1, 2, 3, 4, 5, ...}

Natural Numbers {1, 2, 3, 4, 5, 6, ...}

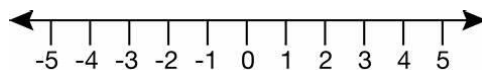**Integers** {...,-3, -2, -1, 0, 1, 2, 3,...}

Decimals
Decimal means "based on 10". Decimals are used to represent integer and non-integer numbers. A decimal can be defined as a whole number part and a fractional part. Decimals are the digits after the separator, which is a "dot", but also a comma in some countries.

Fractions
A fraction is a part of a whole or the number of equal parts.

THE NUMBER LINE

A **number line** is a picture that shows real numbers as points. It goes on forever in both directions. A number line can be used to add, subtract, and compare real numbers.

To add a positive number, count to the right. **To add a negative number**, count to the left. **To subtract a positive number**, count to the left. **To subtract a negative number**, count to the right.

As you move to the right on the number line, values increase (become more positive). As you move to the left on the number line, values decrease (become more negative).

GEOMETRY BASICS

Point: An exact location in space or on a flat surface

Line: A collection of points that continues in both directions

Plane: A flat surface (like a tabletop) having only length and width

Angle: Two rays that share an endpoint

Line Segment: A part of a line with two endpoints

Ray: A part of a line with one endpoint

Parallel Lines: Lines that never intersect

Perpendicular Lines: Lines that intersect only at right angles

Polygon: A plane (flat) figure with at least 3 straight sides

MATH OPERATIONS

The **four operations** in math are **add**, **subtract**, **multiply**, and **divide.**

When you **add** the answer is called the **sum**.

When you **subtract** the answer is called the **difference**.

When you **multiply** the answer is called the **product**.

When you **divide** the answer is called the **quotient**.

Addition and subtraction are opposites (inverses), and multiplication and division are opposites (inverses).

ORDER OF OPERATIONS

The order of operations is an agreed upon set of rules that we apply in sequence when evaluating numerical expressions.

First: Complete operations inside parentheses first. This may include powers being inside of the parentheses.

Second: Evaluate any powers.

Third: Perform multiplication and division from left to right (no matter which of the two operations come first).

Fourth: Perform addition and subtraction from left to right (no matter which of the two operations comes first).

PROPERTIES OF REAL NUMBERS

Commutative Property of Addition: Order does not matter when you add. You get the same sum. $a + b = b + a$

Commutative Property of Multiplication: Order does not matter when you multiply. You get the same product. $a \times b = b \times a$

Associative Property of Addition: The order in which you group the addends does not matter. Your get the same sum. $a + (b + c) = (a + b) + c$

Associative Property of Multiplication: The order in which you group factors does not matter. You get the same product. $a \times (b \times c) = (a \times b) \times c$

Identity Property of Zero: Any real number plus zero equals the real number. $a + 0 = a$

Identity Property of Multiplication: Any real number times one equals the real number. $a \times 1 = a$

Distributive Property: Uses multiplication over addition and multiplication over subtraction. Multiplying a factor by a sum is equal to performing each multiplication separately.
$a(b + c) = a \times b + a \times b$
$a(b - c) = a \times b - a \times b$

MEASUREMENT

U.S. Customary System

Length	Weight/Mass	Capacity
Foot	Mass	Cup
Inch	Ounce	Gallon
Mile	Pound	Ounce
Yard	Ton	Pint
		Quart

Metric System

Length	Mass	Capacity
Centimeter	Gram	Liter
Kilometer	Kilogram	Milliliter
Meter	Gram	
Millimeter	Milligram	

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere at solving them (keep on going).
2. Reason abstractly and quantitatively (think what makes sense).
3. Construct viable arguments and critique the reasoning of others (talk and explain).
4. Model with mathematics (show your thinking).
5. Use appropriate tools strategically (use the right tools).
6. Attend to precision (check your work).
7. Look for and make use of structure (see the pattern or connection).
8. Look for and express regularity in repeated reasoning (see the pattern or connection).