Chapter 1: Numbers and Number Sets

Number Sets

Whole Numbers
$\{0, 1, 2, 3, 4, 5, …\}$
Numbers from 0 upwards without decimals

Counting Numbers
$\{1, 2, 3, 4, 5, …\}$
Whole numbers from 1 upwards

Integers
$\{…, -3, -2, -1, 0, 1, 2, 3, …\}$
All positive and negative counting numbers and zero

Rational Numbers
$\{\frac{p}{q}$ where $q \neq 0$ and the decimal representation is terminating or repeating$\}$
Numbers that can be written as a fraction of integers and the decimal representation is terminating (stops at a place value) or repeating (place values start to repeat)

Irrational Numbers
$\{\frac{p}{q}$ where $q \neq 0$ and the decimal representation is non-terminating and non-repeating$\}$
Any number that is not rational.

Imaginary Numbers
{Any number when squared gives a negative result}
For example: $\sqrt{-4}$
NOTE: Imaginary unit is defined by $i = \sqrt{-1}$.

Complex Numbers
{a number that can be expressed as $a + bi$}
NOTE: a and b are real numbers and i is the imaginary unit.

## Vocabulary on Numbers

Odd Numbers   {..., -5, -3, -1, 1, 3, 5, ...}
                      Numbers that cannot be divided evenly into two groups

Even Numbers   {..., -4, -2, 0, 2, 4, ...}
                      Numbers that can be divided evenly into two groups
                      NOTE: zero is an even number

Positive numbers {1, 2, 3, 4, 5, ...}
                      All numbers (decimals, fractions and whole numbers) greater than 0
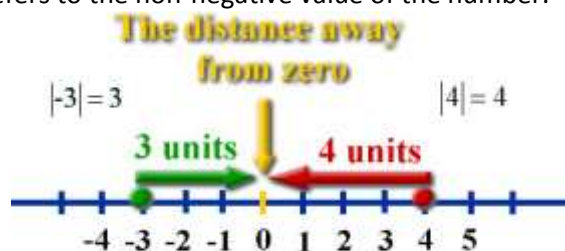
Negative numbers: {All numbers (decimals, fractions and whole numbers) less than 0}

                      NOTE: zero is neither a positive number nor a negative number
                      Non-negative refers to numbers 0 or positive
                      Non-positive refers to numbers 0 or negative
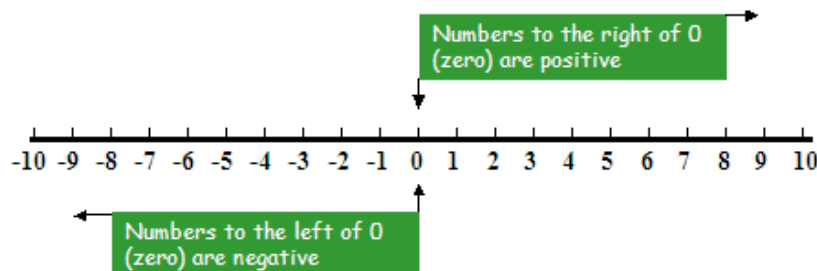
Consecutive numbers   Numbers that follow each other in order (for example: 24, 25, 26)

Prime Numbers   {2, 3, 5, 7, 11, 13, 17, 19, 23, ...}
                      Whole numbers greater than 1 and are only divisible by 1 and itself.
                      NOTE: 1 is not a prime number and 2 is the only even prime number.

Absolute value   Distance a number is away from zero on a number line.
                      It refers to the non-negative value of the number.

Absolute Value