

1.1 Numbers



Natural Numbers are 1, 2, 3, 4 and so forth. AKA

counting numbers

Whole Numbers are 0, 1, 2, 3, 4 and so forth.

Integers include natural numbers, zero, and the opposites of the natural numbers. Examples of integers are ... -4, -3, -2, -1, 0, 1, 2, 3, 4, ...

The negative numbers are called the negative integers and the natural numbers are called positive integers. The number 0 is neither positive nor negative.

Rational Numbers include the integers and all other numbers that can be expressed as the quotient of two integers. A rational number can also be expressed by a decimal number that repeats or terminates.

$2 = \frac{2}{1}$ $\frac{1}{3}$ $\frac{1}{2}$ $.2$ $\sqrt{2}$

Irrational Numbers are numbers that cannot be expressed as the quotients of two integers. An irrational number can also be expressed by a decimal number that does not repeat or terminate

π e $\sqrt{2}$ $\sqrt{3}$ ~~$\frac{1}{2}$~~

Rational numbers

irrational numbers
Real numbers



Real Numbers

are the rational numbers combined with the irrational numbers.

Real Numbers may be represented by points on the number line.

The usual line is a horizontal line that has been marked in equally spaced intervals.

One of these marks is called the origin and is indicated by the number zero (0).

The marks to the right are labeled using the positive integers.

The negative integers are used to designate the marks to the left of the origin.



Imaginary numbers \rightarrow Square roots of
 i, j $\sqrt{-5}$ negative numbers

Brunnermath

Fractions

$$\frac{1}{3}, \frac{\pi\sqrt{3}}{2}, \frac{3\sqrt{-2}}{\pi}$$

A Fraction may contain any number or Symbol representing a number in its numerator or in its denominator.

a fraction may be a number that is rational, irrational, or imaginary

the number line



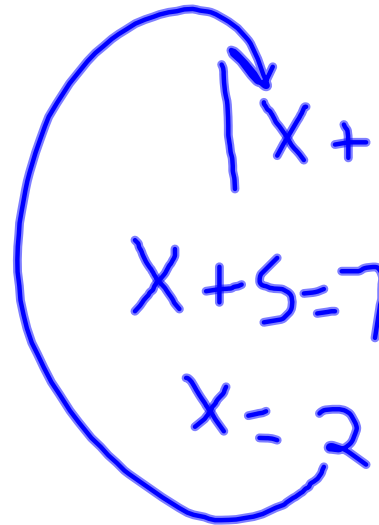
absolute value

$$-|-6| = -6 \quad -|5| = -5$$

Absolute Value is the distance of a number from zero.
 The absolute value of a number is indicated by placing the number between vertical bars, | |

$$|5| = 5$$

$$|-5| = 5$$



$$|x + 5| = 7$$

$x + 5 = 7$	$x + 5 = 7$
$x = 2$	$x = -12$

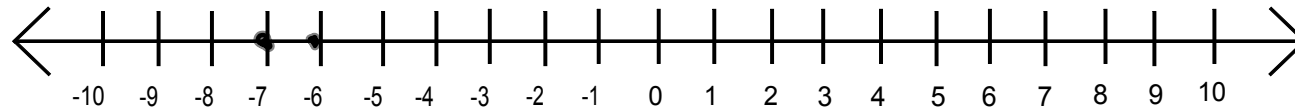
signs of inequality

A number is larger than another if it is located farther to the right on the number line.

We say the number farther to the right on the number line is greater than the other number. The symbol $>$ is used to indicate that one number is greater than another. If the first number is to the left of the second number on the number line then the first number is less than the second.

We use the symbol $<$.

$$-6 > -7$$



$$\frac{1}{0} = \frac{0}{1}$$

reciprocal

$$\frac{1}{1} \quad \frac{2}{1} \quad \frac{3}{1}$$

Every number, except zero, has a reciprocal.

The reciprocal of a number is equal to 1 divided by that number.

If the number is a fraction, then the reciprocal is 1 divided by the fraction or $1/\text{fraction}$.

The reciprocal of $5/4$ is $1/5/4$ or $4/5$.

Denominate numbers

numbers that represent a measurement and are written with units of measurement

150 pounds

15c

literal numbers

numbers that are represented by letters

b, r

5-35
020

constants

literal numbers that are held fixed

5 - 3

variables

literal numbers that vary in a given problem

x, y