

Algebra - Basic Definitions

What is an Equation

An equation says that two things are equal. It will have an equals sign "=" like this:

$$x + 2 = 6$$

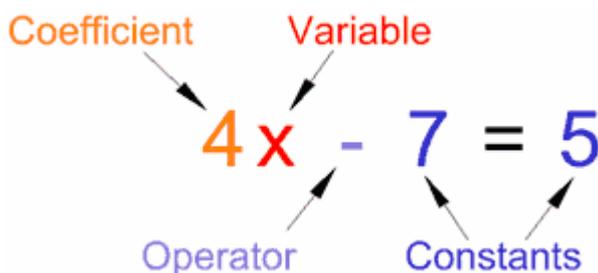
That equation says: **what is on the left** ($x + 2$) **is equal to what is on the right** (6)

So an equation is like a **statement** "*this equals that*"

Parts of an Equation

So that people can discuss equations, there are names for different parts (better than saying "that thingy there"!)

Here we have an equation that says $4x-7$ equals 5, and all its parts:

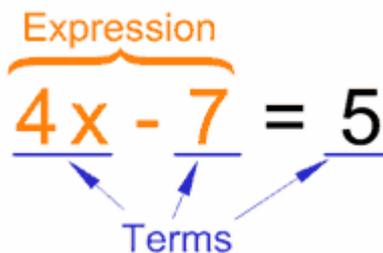


A **Variable** is a symbol for a number we don't know yet. It is usually a letter like x or y.

A number on its own is called a **Constant**.

A **Coefficient** is a number used to multiply a variable ($4x$ means 4 times x, so 4 is a coefficient)

An **Operator** is a symbol (such as +, ×, etc) that represents an operation (ie you want to do something with the values).

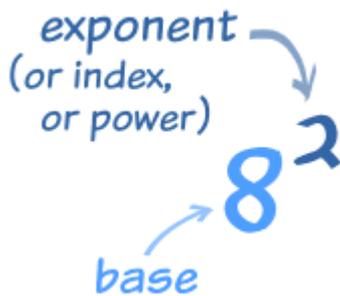


A **Term** is either a single number or a variable, or numbers and variables multiplied together.

An **Expression** is a group of terms (the terms are separated by + or - signs)

So, now we can say things like "that expression has only two terms", or "the second term is a constant", or even "are you sure the coefficient is really 4?"

Exponent!



The exponent (such as the 2 in x^2) says **how many times** to use the value in a multiplication.

Examples:

$$8^2 = 8 \times 8 = 64$$

$$y^3 = y \times y \times y$$

$$y^2z = y \times y \times z$$

Exponents make it easier to write and use many multiplications

Example: y^4z^2 is easier than $y \times y \times y \times y \times z \times z$, or even **yyyyzz**

Polynomial

Example of a Polynomial: $3x^2 + x - 2$

A polynomial can have **constants**, **variables** and the **exponents 0,1,2,3,...**

And they can be combined using addition, subtraction and multiplication, ... **but not division!**

exponents: 0,1,2,...

$$5xy^2 - 3x + 5y^3 - 3$$

terms

A Polynomial

$$3xy^{-2}$$
$$\frac{2}{x+2}$$

Not Polynomials

Monomial, Binomial, Trinomial

There are special names for polynomials with 1, 2 or 3 terms:

$$3xy^2$$

Monomial (1 term)

$$5x - 1$$

Binomial (2 terms)

$$3x + 5y^2 - 3$$

Trinomial (3 terms)

Like Terms

"Like terms" are **terms** whose variables (and their [exponents](#) such as the 2 in x^2) are the same.

In other words, terms that are "like" each other. (Note: the **coefficients** can be different)

Examples:

	Terms	Why are they "Like Terms"
	$7x$ x $-2x$	because the variables are all x
	$(1/3)xy^2$ $-2xy^2$ $6xy^2$	because the variables are all xy^2

You can add **like terms** together to make one term:

Example: $7x + x = 8x$

Unlike Terms

If they are not like terms, they are called "**Unlike Terms**":

	Terms	Why are they "Unlike Terms"
	$-3xy$ $-3y$ $12y^2$	← these are all unlike terms (xy , y and y^2 are all different)