

Algebraic Expressions

An **algebraic expression** is a single term or a set of terms that are combined using addition (+), subtraction (-), multiplication (x) and division (÷)


Examples

$$3x$$

$$2x + 3y$$

$$2 - 5y^2$$

$$2x + 3y - 5$$



An expression that contains two terms is called a binomial.

Algebraic Terms

Algebraic terms are individual letters, groups of letters, or groups of letters and numbers separated by addition or subtraction in algebraic expressions.

Every algebraic term has a **coefficient** (the number in the term) and a **variable** (the letter or letters in the term).

coefficient $7x$ variable



 Example

The expression $5x + y - xy$ has three algebraic terms.

Collecting Like Terms

Collecting like terms is a way of simplifying algebraic expressions.

To do this we identify the like terms in an algebraic expression and combine them by adding or subtracting.

 Example

Collect the like terms $3a + 4b + 2a - 2b$

$3a$ and $+2a$ are like terms.

$+4b$ and $-2b$ are different like terms.

The addition or subtraction sign in front of a term belongs to that term.

$$\begin{aligned} 3a + 4b + 2a - 2b &= 3a + 2a + 4b - 2b \\ &= 5a + 2b \end{aligned}$$

Equations

Equations are mathematical expressions which contain one or more variables and an equals sign.

 Examples

$$3x - 5 = 7$$

$$\frac{4(x - 2)}{5} = 8$$

$$x^2 = 9$$

$$2x^2 - 3x - 5 = 0$$

We can solve an equation to find the value of the variable(s).

 Example

Solve $4x + 3 = 23$

$$4x + 3 = 23$$

-3

-3

$$4x = 20$$

$\div 4$

$\div 4$

$$x = 5$$

Rearranging Equations

Rearranging equations means we **change the subject** of the equation to display it in a different way. We move variables and constants (numbers) to the other side of the equation to leave the variable we want by itself.

 **Example** Make a the subject of $b = 2a - 3$

$$b = 2a - 3$$

+3

+3

$$b + 3 = 2a$$

÷2

÷2

$$\frac{b + 3}{2} = a$$

↑
Here b is the subject, because it is the single variable equal to everything else. We want to rearrange to write an expression with the variable a equal to everything else.