



Algebraic Expressions

Year 9 Mathematics
Mainstream

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Learning Objectives

By the end of the lesson I hope that you understand and can apply the following to a range of questions from the Year 9 Mathematics course.

- To review the definitions and conventions of algebra
- To know how to combine numbers and variables to write algebraic terms and expressions
- To be able to express a word problem as a mathematical expression using pronumerals and mathematical operations
- To be able to substitute values for pronumerals in expressions and evaluate



Recap of past learning

This is a new section of the course which will build on the work which has already been covered in Years 7 and 8 relating to Algebra.

This section (and the next) are consolidating sections where past knowledge will be recapped and built upon.

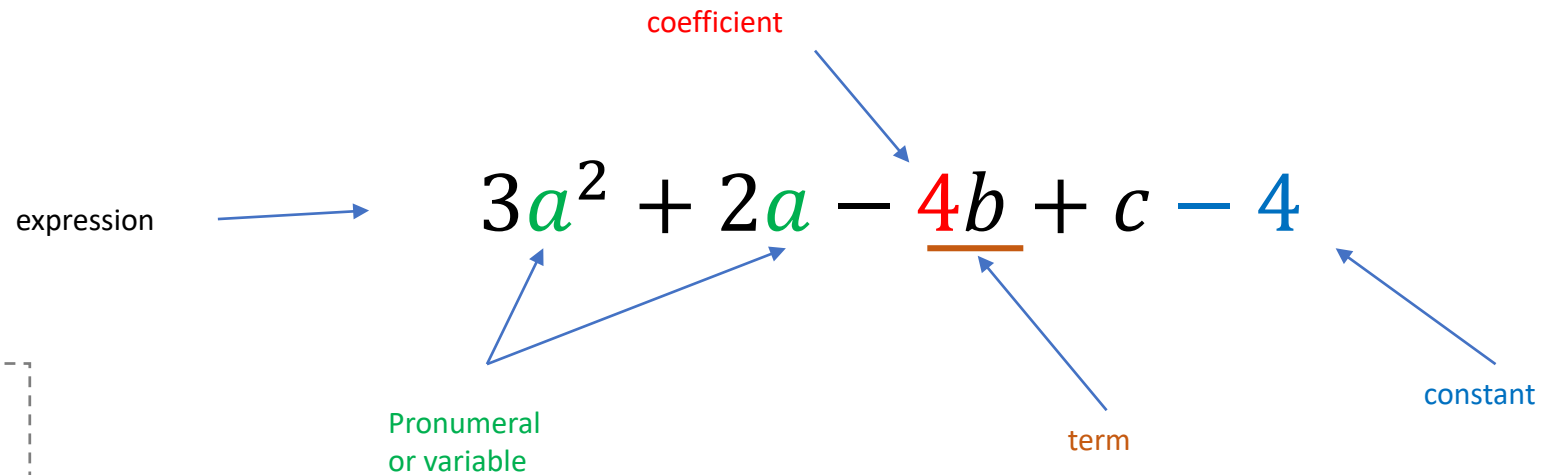
Algebra is a massively important section of the course and requires care and attention to learn the few rules which govern its use. Practice and more practice will see you succeed this year and into the future.



Some important language

When we look at the following we can see there is a lot of language to algebra.

You will need to ensure you understand the language and use it. We call this **communicating mathematically**.



equation

$$3x + 2 = 11$$



BIDMAS or BODMAS

Whichever you use, it is really, really important!

Brackets

Indices

Division

Multiplication

Addition

Subtraction

Floaty Numbers

a^2



To eVALUEate

OK ... so it's misspelt, but the idea is there!

When we evaluate something we are being asked to find the VALUE of something.

This will normally mean we need to substitute a value in place of a pronumeral.

Year 9 will require a lot of substitution!



English into Maths

The people who do the best at Maths are generally the people who understand English.

Comprehension is the key when reading the questions.

Everyone can do Maths! Really. You just need to understand what the question is asking of you.

For example, write an **algebraic expression** for:

- the number of tickets needed for 3 boys and r girls
- the cost of P pies at \$3 each
- the number of grams of peanuts for one child when 300 g of peanuts is shared equally among C children.

$$3 + r$$

$$\$3 \times P = \$3P$$

$$\frac{300 \text{ g}}{C}$$



Example: Converting words into sentences

Write an algebraic expression for:

- five less than x three more than twice x
- the sum of a and b is divided by 4
- the square of the sum of x and y

$$x - 5$$

$$2x + 3$$

$$(a + b) \div 4$$

$$\frac{a + b}{4}$$

$$(x + y)^2$$

Note:

“Less than” has something to do with subtraction.

“Sum” means things are going to be added
“Square” means to multiply a number by itself. It has a special notation with a “floaty 2”.



Example: Substituting values into expressions

Evaluate these expressions when $a = 5$, $b = -2$ and $c = 3$

- $7a - 2(a - c)$
- $b^2 - ac$

$$\begin{aligned} & 7a - 2(a - c) \\ &= 7 \times 5 - 2(5 - 3) \\ &= 7 \times 5 - 2 \times 2 \\ &= 35 - 4 \\ &= \underline{\underline{31}} \end{aligned}$$

$$\begin{aligned} & b^2 - ac && -2 \times -2 \\ &= -2^2 - 5 \times 3 \\ &= 4 - 15 \\ &= \underline{\underline{-11}} \end{aligned}$$

Note:

When we substitute, we replace a pronumeral with a number.

We must remember that when a letter and number (or letters) are stuck together, there is a multiplication sign in between.



Work to complete

The following work is the **minimum** you are expected to complete in class and at home.

You are welcome to answer more questions if you feel you have the time.

Exercise 2A

Questions: 1, 3, 4, 6, 8, 9, 10

