

# ALGEBRA

## What do I need to be able to do?



Spring term  
Algebra 2

## Topics

- Forming expressions/equations
- Expanding/factorising (single)
- Substitution
- Solving 1 and 2 step equations

- Multiply a single term over a bracket and simplify by factorising
- Substitute numbers into formulae
- Derive a formula and set up equations from worded problems
- Solve linear equations

## Key Vocabulary

Expression	Numbers, symbols and operators (such as + and ×) grouped together that show the value of something
Equation	An equation says that two things are equal. It will have an equals sign "="
Substitute	Putting values where the letters are
Solve	To find a value (or values) we can put in place of a variable that makes the equation true
Simplify	In general, an expression is in simplest form when it is easiest to use
Expand	Expand is when we multiply to remove the ( )
Factorise	Finding what to multiply to get an expression
Inverse	Opposite in effect. The reverse of

## Career Links

Being able to confidently work with algebra is a great skill to have and has lots of links with a number of careers such as:

- Cryptologist
- Carpenter
- Astronomer
- Electrician
- Architect

## Linear expressions

Expand and simplify where appropriate

1)  $7(3 + a) = 21 + 7a$

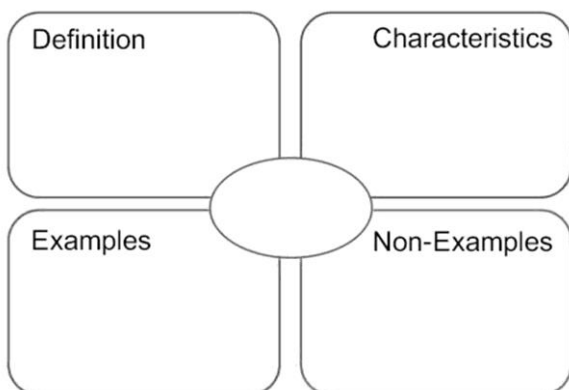
2)  $2(5 + a) + 3(2 + a) = 10 + 2a + 6 + 3a$   
 $= 5a + 16$

Note – collect like terms to simplify

3) Factorise  $9x + 18 = 9(x + 2)$

4) Factorise  $6e^2 - 3e = 3e(2e - 1)$

Note – to 'factorise fully' means take out the HCF.



## Set up equations from word problems

Jenny, Kenny, and Penny together have 51 marbles. Kenny has double as many marbles as Jenny has, and Penny has 12. How many does Jenny have?

Set up an equation then solve

Jenny's + Kenny's + Penny's = 51

$$n + 2n + 12 = 51$$

$$3n + 12 = 51$$

$$3n = 39$$

$$n = 13$$

## Unknown on one side

Solve  $2x + 1 = 9$

$$2x + 1 = 9$$

$$2x = 8$$

$$x = 4$$

Solve  $3(y - 7) = 9$

$$3y - 21 = 9$$

$$3y = 30$$

$$y = 10$$

You can check your answers by substituting your answer back into the question

Simplify the expression:  $4w + 3 + 2w - 1$

$$4w + 3 + 2w - 1 \quad (\text{Now Group Like Terms})$$

$$= 4w + 2w + 3 - 1 \quad (\text{Combine Like Terms})$$

$$= 6w + 2$$

Evaluate (find the value of) the expressions, given that:

$$a = 2, \quad b = 3, \quad c = -5$$

1.  $4b = 4 \times 2 = 8$

2.  $7b - 3c = (7 \times 3) - (3 \times -5) = 21 - -15 = 21 + 15 = 36$

Note – Always use the correct order of operations