

Solving linear equations

When solving an equation keep it balanced.
Use inverse operations and do the same thing to both sides.

Solve for x	$3x + 5 = 0$	
	$3x = -5$	(-5)
	$x = -\frac{5}{3}$	$(\div 3)$
	$x = -\frac{5}{3}$	

Year 9 Higher Topic 2

Topic title: Algebra

What careers would use these skills?

Algebra is used to identify an unknown variable.
You are using algebra every time you solve a problem.

Simplifying expressions

You can add and subtract terms with the same variables.

$$5a + a - 3a = 3a$$

You can multiply any variables together.

$$3a \times 4b = 12ab$$

Expanding brackets

Single brackets—multiply everything outside the bracket by everything inside the bracket.

$$2(x+8) = 2x + 16$$
$$(a+4)(a+2) = a^2 + 2a + 4a + 8 = a^2 + 6a + 8$$

Double brackets—multiply everything in the first bracket by everything in the second bracket.

Equations, Expressions and Identities

Equation— a mathematical statement with an equals sign.

Expression—a mathematical statement without an equals sign.

Identity—a mathematical expression which is always true.

Substituting into formulae

Substituting is changing one thing for another.

Substitute $a = 8$ into $5a - 10$

$$5a - 10$$

$$= 5 \times 8 - 10$$

$$= 30$$

Rearranging formulae

Move one thing from one side of an equation or formulae to another. To change the subject of the formulae.

Make a the subject of the formula.

$$3a - 4b = 15$$

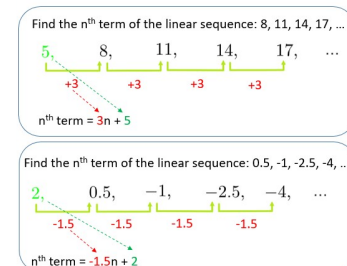
$$3a = 15 - 4b$$

$$a = \frac{15 - 4b}{3}$$

Nth term linear

Nth term is a rule for a sequence.

Linear sequences have a constant difference.



Solving Expressions involving brackets

Expand the brackets then solve the equations using the same method as solving an equation.

$$2(4p + 1) = 18$$

$$8p + 2 = 18$$

$$8p = 16$$

$$p = 2$$

Factorising basic quadratic expressions

$$x^2 + 5x + 6$$

Find two numbers that add together to make the coefficient of the middle term and multiply together to make the final term.

$$x^2 + 5x + 6$$

$$(x + 3)(x + 2)$$

Nth term quadratic

The n^{th} term of a quadratic sequence has a constant second difference.
You always halve the second difference.

Once you have the sequence minus the required n^2 sequence find the n^{th} term of the difference to find the remainder of the quadratic n^{th} term.

