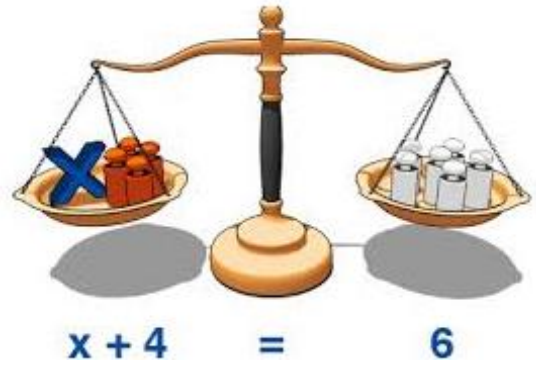
Algebra 2 – Solving Equations – Knowledge Organiser

Objective
Solve two linear simultaneous equations
Solve problems involving linear simultaneous equations
Use graphs to find a solution for a pair of simultaneous equations
Find approximate solutions to complex equations



Key Facts

If you plot the graphs of two equations, the point at which they **intersect** is the **solution** to that pair of equations

If two simultaneous equations have the **same coefficient** for one of the variables, **add or subtract** the two equations to **eliminate** a variable.

If you have found one of the variables in a pair of simultaneous equations, **substitute** this value into one of the original equations to find the second variable.

You should always **check** your solution is correct by **substituting** your values into the original equations. You can also check your solution by **plotting the graphs** and looking at the **point of intersection**

If the two terms with equal coefficients have the **same sign, subtract** the equations to **eliminate** the variable

If the two terms with equal coefficients have **different signs, add** the equations to **eliminate** the variable

If there are **no coefficients the same** in the pair of equal simultaneous equations, **multiply all the terms** in **one or both** equations by a constant so that you get a pair of equal variables (the **lowest common multiple** of the coefficients)

If an equation **cannot be solved** by normal algebraic methods, then you can use the method of **trial and improvement** to get an **approximate solution**. Substitute a value into the equation, then keep on "improving" this value until you get a solution to a given level of accuracy e.g. the nearest whole number

Key words used in this unit:

Variable – a quantity that can take on a range of values

Substitute –Put numbers in place of unknowns (letters) to calculate the value of an expression

Coefficient – An integer that multiplies a variable e.g. in the term 4y, the coefficient is 4

Lowest Common Multiple – the lowest number that is the multiple of two or more given numbers

Intersect – the point at which two lines on a graph cross

Eliminate – get rid of one of the variables to be able to solve a pair of simultaneous equations

Solution – the value(s) of the variable(s) that solves an equation or pair of equations

Key Concept Check

Can you solve a pair of simultaneous equations in more than one way? *e.g. $x + y = 8$, $x + 2y = 14$*

Can you form and solve a pair of simultaneous equations from a contextual problem? *e.g. The sum of Ann and Fred's ages is 28. In seven years time Ann will be twice as old as Fred. How old are they now?*