Year 11 Autumn 2 Algebra

Themes	Objectives (TG 1-9)	Homework Sheets	Interventions - Mathswatch video and worksheet
Algebra Skills	- Writing formulae in words (TG1) - Simplify expressions with positives only (TG2) - **Understand algebraic notation, use to write expressions (TG2)** - Substitution of positive numbers (TG2) - *Solve one step equations (TG2)* - **Simplify expressions with negatives (TG3)** - Substitution of negative numbers (TG3) - Using the nth term of a sequence, find any term (TG3) - *Expand single brackets (TG3)* - *Solve two step equations (TG3)* - *Change the subject by simple rearranging (TG4)* - Find numbers that satisfy certain conditions (TG4) - Substitute non-integer numbers into expressions (TG4) - *Expand and factorise single brackets (TG4)* - Write an expression for the nth term of a sequence (TG4) - **Use index rules when simplifying and substituting (TG5)** - Form expressions arising from shape contexts (TG5) - Know the differences between expressions, equations & identities (TG5) - *Expand double brackets (TG5)* - Factorise & solve quadratics where the x^2 coefficient = 1 (TG5) - **Expand cubic expressions (TG5)** - Solve linear simultaneous equations by elimination or substitution (TG5) - Form and solve simple simultaneous equations (TG5) - Solve two linear simultaneous equations graphically (TG5) - **Simplify complex expressions using index laws (TG6)** - Derive an equation which will lead to a quadratic (TG6) - Use the quadratic formula to solve (TG6) - Factorise & solve quadratics where the x^2 coefficient ≠ 1 (TG7) - Algebraic proof involving expanding/factorising quadratics (TG7) - Deduce the nth term of a quadratic sequence (TG7) - Factorise quadratics using the difference of two squares (TG8) - Form and solve sim. equations involving 1 linear and 1 quadratic (TG8) - Solve quadratics by completing the square (TG9) - Simplify or solve algebraic fractions (TG9) - Solve sim. equations involving a circle and a straight line (TG9) - Proving statements in terms of algebra (TG9)	*Green homework sheet 1* **Green homework sheet 2**	7 Introduction to Algebraic Conventions 33 Simplifying - Addition and Subtraction 34 Simplifying - Multiplication 35 Simplifying - Division 37 Generating a Sequence - Term to Term 93 Expanding Brackets 94 Simple Factorisation 95 Substitution 102 Generating a Sequence from the nth Term 103 Finding the nth Term 104 Special Sequences 134a Expanding and Simplifying - Single Set of Brackets 134b Expanding and Simplifying - Double Set of Brackets 135a Solving Equations - Balancing 135b Solving Equations - Float & Ping 136 Rearranging Simple Formulae 137 Forming Formulae and Equations 140 Simultaneous Equations Graphically 157 Factorising and Solving Quadratics 158 The Difference of Two Squares 162 Simultaneous Equations Algebraically 178 Product of Three Binomials 190 Rearranging Difficult Formulae 191 Solving Quadratics with the Formula 192 Factorising Hard Quadratics 193 Algebraic Proof

Inequalities	- ***Know the difference between <, ≤, ≥, > and ≠ (TG1)*** - Identify integers that fit simple and two-sided inequalities (TG3) - ***Represent inequalities on a number line (TG3)*** - ***Solve simple linear inequalities (TG4)*** - Set up inequalities based on info in the question (TG4) - ***Solve linear inequalities with a variable on both sides (TG5)*** - ***Represent inequalities graphically using correct lines (TG5)*** - ***Identify the region satisfied by inequalities on a graph (TG6)*** - Identify maximum and minimum values (TG7) - Represent quadratic inequalities graphically (TG8) - ***Solve complex quadratic inequalities (TG9)***	***Green homework sheet 3***	138 Inequalities on a Number Line 139 Solve Linear Inequalities 198 Regions 212 Solve Quadratic Inequalites
Functions	- **Inputs/outputs from simple function machines (TG1)** - Draw and interpret real-life graphs inc. conversion (TG2) - Understand y = mx + c with straight line graphs (TG3) - Find the gradient from a graph inc. real life graphs (TG4) - Recognise and sketch linear and quadratic functions (TG4) - Identify and understand parallel lines (TG4) - Know the equations of the x and y axes (TG4) - Recognise and sketch cubic and reciprocal functions (TG5) - Identify roots and turning points of quadratic graphs (TG5) - Find the equation of a line through two given points (TG5) - **Use iteration and understand notation (TG6)** - Use function notation, substituting numerical values (TG6) - Recognise, sketch and plot exponential functions (TG6) - Interpret the meaning of the gradient of graphs (TG6) - Understand perpendicular lines and how to use them (TG6) - Calculate the area under a graph and interpret (TG6) - **Understand composite and inverse functions (TG7)** - Recognise the equation of a circle (TG7) - Estimate the gradient of a curve by drawing a tangent (TG7) - Find the equation of a perpendicular line going through a point (TG8) - Understand the transformation of graphs (TG8) - Estimate the area under a curve and interpret (TG8) - Write the equation of a circle (TG8) - Find the area and radius of a circle from the equation (TG8) - Transform trigonometric graphs (TG9) - Find the equation of a tangent at a point (TG9)	**Green homework sheet 2**	36 Function Machines 96 Straight Line Graphs 97 The Gradient of a Line 98 Drawing Quadratic Graphs 99 Sketching Functions 159a Equation of a Straight Line - y = mx+c 159b Equation of a Straight Line - Gradient and Coordinates 160 Roots and Turning Points of Quadratics 161 Cubic and Reciprocal Graphs 179 Iteration - Trial and Improvement 180 Iterative Processes 194 Exponential Functions 196a Transformation of Polynomial Functions 196b Transformation of Trigonometric Functions 197 Equation of a Circle 214a Inverse Functions - Introduction 214b Inverse Functions - Harder Questions 215 Composite Functions