Caroline Chisholm School
Ambition Confidence Success
Everyone Every Lesson Every Opportunity

Year 11 Mathematics Curriculum

Unit	Core Knowledge/Skill development Higher content only	Sequence	Assessment	Literacy, numeracy, PSHE, FBV, other links	ACP and VAA development	Home learning and enrichment
Indices and roots (2 weeks)	Fluency and reasoning skills: Square and cube numbers to calculate higher powers and roots. Develop understanding of powers of ten and represent numbers in standard form. Apply rules for addition and subtraction of indices to simplify expressions. Introduce and practice the	Builds on Year 10 work with indices and standard form, extending to fractional and negative indices, with a focus on applying these in problem-solving contexts.	End of unit assessment	Key words: Square Cube Root Prime Integer	 Meta-cognition: The ability to knowingly use a wide range of thinking approaches and to transfer knowledge from one circumstance to another.  Connection finding: The ability to use connections from the past experiences to seek possible generalisations.	Mathswatch lesson and homework task.

	concepts of zero and negative indices, linking them to previously learned index laws. Explore powers of powers to deepen understanding of index notation. **Understand and use fractional indices to express and calculate roots as powers.** Perform calculations with numbers in standard form, including multiplication, division, and comparisons.				 Agile learners; Working with an enquiring mind.	

Manipulating Expressions (2 weeks)	Simplify algebraic expressions, building on Year 10 knowledge of factorization and expansion. Use and understand mathematical identities in equations. **Add, subtract, multiply, and divide algebraic fractions, starting with simple examples and progressing to more complex cases.** Form and solve equations and inequalities **involving algebraic fractions, with a focus on problem-solving**	Revisits algebraic manipulation from Year 10, advancing to include identities and algebraic fractions to develop deeper reasoning skills.	End of Unit Assessment 2	Expression Term Simplify Coefficient Power Like/Unlike	 Critical or logical thinking: The ability to deduct, hypothesise, reason, seek supporting evidence. Complex and multi-step problem solving: The ability to break down a task, decide on a suitable approach, and then act.  Agile learners; learning with enquiring minds.	Mathswatch lessons and homework tasks.

	and interpretation of results. Represent numbers algebraically and use algebraic arguments to construct proofs.					
Gradients and Lines (2 weeks)	Plot straight-line graphs. Interpret y = mx + c Find the equation of a straight line from a graph Derive the equation of a straight line from one point and the gradient, progressing to finding equations from two points. **Recognise and determine**	Students deepen their understanding of linear relationships, connecting algebraic expressions to graphical representations and extending to perpendicular lines. Gradually develops from plotting and interpreting	End of Unit Assessment 3	Gradient, Intercept, Linear Equation, Perpendicular.	 Meta-cognition: The ability to knowingly use a wide range of thinking approaches and to transfer knowledge from one circumstance to another.	Matchswatch Lessons and homework tasks.

	equations of perpendicular lines using the relationship between gradients. Solve linear simultaneous equations graphically, linking algebraic and graphical representations.	straight-line graphs to deriving equations and solving simultaneous equations graphically, incorporating perpendicular line relationships for higher-level understanding.				
Non – Linear Graphs (2 weeks)	Recognise and sketch key non-linear graph shapes, including quadratic, cubic, reciprocal, and exponential graphs. Plot quadratic graphs and identify their roots, intercepts,	This block introduces students to non-linear graphs, building their ability to interpret and analyse complex graphical relationships. Introduces quadratic graphs before moving to	End of Unit Assessment 4	Quadratic, Cubic, Reciprocal, Exponential, Circle, Tangent.	 Meta-cognition: The ability to knowingly use a wide range of thinking approaches and to transfer knowledge from one circumstance to another.	Matchswatch Lessons and homework tasks.

	and turning points. Explore cubic and reciprocal graphs to understand their unique characteristics. **Introduce and plot exponential graphs, emphasizing their applications in real-world contexts.** **Find and use the equation of a circle cantered at (0, 0), and determine tangents to curves.**	cubic, reciprocal, and exponential graphs, and concludes with circles and tangents, providing a comprehensive exploration of non-linear graph types.				
Using Graphs (2 weeks)	Construct and interpret conversion graphs,	This block enhances students' ability to interpret and	End of Unit Assessment 5	Conversion, Direct Proportion, Inverse Proportion, Curve,	 Precision: The ability to work	Matchswatch Lessons and homework tasks.

	emphasizing real-life applications. Analyse distance-time and speed-time graphs, extracting and interpreting key information. Recognise and compare graphs illustrating direct and inverse proportion. **Estimate the area under a curve, introducing students to the concept of integration.**	construct graphs, developing skills applicable to real-world problems and advanced mathematical concepts. Begins with basic construction and interpretation of graphs, progressing to direct and inverse proportion, and concludes with estimation techniques for areas under curves.		Area Under a Graph.	effectively within the rules of the domain. Complex and multi-step problem Solving: The ability to break down a task, decide on a suitable approach, and then act.	
Expanding and Factorising (2 weeks)	Factorise quadratic expressions, starting with simple forms and	This block consolidates and extends students' skills in solving quadratic	End of Unit Assessment 6	Factorisation, Quadratic, Completing the Square, Quadratic Formula.	 Complex problem solving: The ability to break down a	Matchswatch Lessons and homework tasks.

	progressing to complex cases. Solve quadratic equations by factorisation and using the quadratic formula. Complete the square for quadratic equations and use this to find turning points.	equations, preparing them for advanced algebra and graphing. Begins with simple factorisation techniques, moving to solving quadratic equations, and concludes with advanced methods such as completing the square and using the quadratic formula.			task, decide on a suitable approach, and then act.  Agile learners; Working with an enquiring mind.	
Changing Subjects (2 weeks)	Solve linear equations and inequalities. Form and solve equations and inequalities in various contexts,	Develops algebraic manipulation skills and introduces iterative methods,	End of Unit Assessment 7	Subject, Formula, Iteration, Linear Equation, Inequality.	 Complex problem solving: The ability to break down a task, decide on a suitable	Matchswatch Lessons and homework tasks.

	including geometry. Change the subject of simple and complex formulae, **including cases where the subject appears more than once. Solve equations by iteration, linking to graphical solutions.**	building problem-solving capabilities for real-world contexts. Progresses from solving basic equations to changing the subject in complex formulae and solving equations by iteration.			approach, and then act.  Agile learners; Working with an enquiring mind.	
Functions (3 weeks)	Use function machines and notation. **Work with composite and inverse functions, developing a deeper understanding of function relationships.**	This block focuses on advanced function concepts, including composite and inverse functions, essential for higher-level mathematics.	End of Unit Assessment 8	Function, Composite, Inverse, Quadratic Inequality.	 Precision: The ability to work effectively within the rules of the domain. Complex and multi-step problem Solving: The	Matchswatch Lessons and homework tasks.

	Solve quadratic inequalities graphically, linking to graph interpretation skills from earlier blocks.	Starts with basic function operations before introducing composite and inverse functions and concludes with graphical solutions to inequalities.			ability to break down a task, decide on a suitable approach, and then act.	
Multiplicative Reasoning (2 weeks)	Apply scale factors in real-world contexts. Calculate with pressure and density, introducing scientific applications of proportional reasoning. Construct and interpret equations for direct and	Reinforces proportional reasoning and introduces practical applications in science and engineering. Begins with real-world applications of scale factors and progresses to constructing equations for	End of Unit Assessment 9	Scale Factor, Pressure, Density, Proportion.	 Precision: The ability to work effectively within the rules of the domain. Complex and multi-step problem Solving: The ability to break down a task, decide on a suitable approach, and then act.	Matchswatch Lessons and homework tasks.

	inverse proportion, **extending from graphical representations to algebraic forms.**	direct and inverse proportion.				
Geometric Reasoning (3 weeks)	Use trigonometric ratios and exact values to solve geometric problems. Solve problems involving vectors and **prove geometric facts using deductive reasoning. Apply knowledge of angles, circle theorems, and Pythagoras' theorem.**	Consolidates geometry skills and introduces advanced problem-solving with vectors and trigonometry. **Sequence:** Moves from solving geometric problems to proving geometric facts, incorporating circle theorems and vector applications.	End of Unit Assessment 10	Angle, Circle Theorem, Radius, Tangent, Segment, Trigonometry, Vectors.	 Precision: The ability to work effectively within the rules of the domain. Complex and multi-step problem Solving: The ability to break down a task, decide on a suitable approach, and then act.	Matchswatch Lessons and homework tasks.