
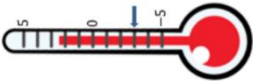
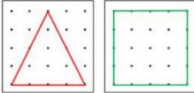
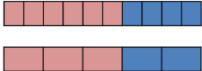




Key Stage 3 Curriculum Journey: YEAR 7

The curriculum in Mathematics will provide students with opportunities to develop skills linked to numerical thinking, as well as an awareness of the application of numerical, geometric and abstract algebraic concepts. Students will be supported to develop the necessary skills to be able to function in the world as confident, numerate citizens who are able to problem solve in a logical and systematic manner.

THE YEAR 7 CURRICULUM JOURNEY

	HALF TERM 1	HALF TERM 2	HALF TERM 3	HALF TERM 4	HALF TERM 5	HALF TERM 6
Topic and learning focus						
	<p>Algebraic Thinking:</p> <ol style="list-style-type: none"> Sequences Understand and Use Algebraic Notation Equality and Equivalence <p>Place Value and Proportion:</p> <ol style="list-style-type: none"> Place Value and Ordering Integers and Decimals Fraction, Decimal and Percentage Equivalence 		<p>Applications of Number:</p> <ol style="list-style-type: none"> Solving Problems with Addition and Subtraction Solving Problems with Multiplication and Division Fractions and Percentages of Amounts <p>Directed Number:</p> <ol style="list-style-type: none"> Operations and Equations with Directed Number <p>Fractional Thinking:</p> <ol style="list-style-type: none"> Addition and Subtraction of Fractions 		<p>Lines and Angles:</p> <ol style="list-style-type: none"> Construction and Measuring Geometric Reasoning 	<p>Reasoning with Number:</p> <ol style="list-style-type: none"> Developing Number Sense Sets and Probability Prime Numbers and Proof
Foundational Knowledge Prior learning needed	<ul style="list-style-type: none"> Students build on their KS2 skills of recognising and extending patterns, as well as making the link between diagram and written representations. Concepts are interleaved through the term with knowledge build on each time. Numerical skills are not a barrier here as all work can be delivered using a calculator. 		<ul style="list-style-type: none"> Students will build on the formal methods of addition, subtraction, multiplication and division developed at KS2. This will be considered and taught in the context of problem solving. Students will have limited experience of directed numbers from primary school so this topic is designed to extend and deepen their existing knowledge. Fractional thinking builds on the FDP equivalence topic block from the Autumn term. Visual representations and heavily present to allow students to understand the concept of equivalence in greater depth. 		<ul style="list-style-type: none"> Students will build on their KS2 skills of using measuring equipment accurately. Students will formalise their knowledge of shapes and their properties, specifically looking at terminology and correct mathematical notation. Students should know that angles at a point sum to 360° and that angles are a measure of turn. 	<ul style="list-style-type: none"> Students will review/extend their mental strategies with a focus on using a known fact to find other facts. FDP will be revisited in the study of probability. Factors and multiples will be revisited to introduce the concept of prime numbers. Venn diagrams will be revisited and applied in the content of prime factor decomposition.
Core Knowledge and skills	<ul style="list-style-type: none"> Describe and continue sequences in diagram and number forms. Use single function machines and series of two function machines with numbers, bar models and fact families. Understand the concept of equality and use fact families. Form and solve one-step equations. 		<ul style="list-style-type: none"> Use mental and formal written methods for addition, subtraction, multiplication and division. Awareness of place value and the impacts of multiplying and dividing by powers of 10. Order directed numbers. Use a calculator with directed numbers. Solve two step equations. 		<ul style="list-style-type: none"> Understand and use geometric notation (sides, properties and angles). Draw, measure and classify angles. Recognise and identify polygons based on their properties (inc. parallel/perpendicular lines). Know angle facts linked to points, line and triangles/quadrilaterals. 	<ul style="list-style-type: none"> Know and use mental arithmetic strategies for integers, decimals and fractions. Know and use the vocabulary for probability, as well as the probability scale. Interpret and draw Venn diagrams. Find multiples and factors.



	<ul style="list-style-type: none"> • Recognise and use place value of integers and decimals. • Work out intervals and use number lines. • Understand how to represent a fraction as a diagram and investigate equivalence. 	<ul style="list-style-type: none"> • Convert between mixed numbers and improper fractions and recognise diagram representations of mixed numbers. 		
Developmental Knowledge and Skills	<ul style="list-style-type: none"> • Recognise linear and non-linear sequences and be able to make conclusions based on this. • Use and interpret algebraic notation. • Understand and use inverse operations. • Form and substitute into expressions. • Understand equivalence of algebraic expressions. • Simplify expressions by collecting like terms. • Compare and order numbers. • Round numbers to positive powers of 10, as well as to one significant figure. • Interchange between fractions, decimals and percentages for unit fractions. • Calculate equivalent fractions. 	<ul style="list-style-type: none"> • Solve problems in the context of area/perimeter, money and frequency trees/tables. • Solve problems in the context of a range of statistical diagrams. • Convert between metric units. • Find the HCF and LCM of small numbers. • Begin to appreciate and apply the order of operations. • Add and subtract fractions. 	<ul style="list-style-type: none"> • Construct triangles. • Apply angle facts to solve problems involving multiple lines/angles. Form short chains of reasoning linked to missing angles. 	<ul style="list-style-type: none"> • Apply knowledge of factors to simplify calculations. • Use known numerical and algebraic facts to derive other facts. • Understand and use the intersection and union of sets. • Generate sample spaces and calculate probabilities for single events. • Identify factors of expressions. • Identify the HCF and LCM.
Complex Knowledge	<ul style="list-style-type: none"> • Compare numerical and graphical representations of sequences. Generate sequences from algebraic expressions. • Identify missing terms in sequences using knowledge of intervals. • Represent functions graphically. • Use ordered lists to find the median and range of a set of numbers. • Explore and use standard index form. • Interpret pie charts using knowledge of fractions of amounts in diagram form. • Convert between fractions, decimals and percentages for non-unit fractions. 	<ul style="list-style-type: none"> • Calculate the mean of a set of numbers and discuss the use of this measure. • Apply numerical skills to calculating fractions and percentages of amounts. • Explore the use of standard index form as an extension of multiplying and dividing numbers by powers of 10. • Calculate the area and perimeter of shapes given with algebraic side lengths. • Find the HCF and LCM of algebraic expressions. • Add and subtract fractions and decimals using application of FDP conversion skills. • Introduce the awareness that negative square roots exist. 	<ul style="list-style-type: none"> • Apply angle drawing and measuring skills to constructing and interpreting accurate pie charts. • Construct polygons with > 3 sides. • Find and apply the angle sum of polygons with > 4 sides. • Investigate and deduce parallel line angle facts. • Use known facts to obtain simple proofs. 	<ul style="list-style-type: none"> • Use estimation as a method for checking mental calculations. • Use prime factor decomposition to find the HCF and LCM. • Understand use the complement of a set. • Use counterexamples to disprove a conjecture.
Links with the National Curriculum	<ul style="list-style-type: none"> • Developing fluency, reasoning and problem solving are embedded throughout the SoL, rather than treated separately. <p>STRAND(S): Number (Understand and Represent; FDP); Algebra (Understand Notation and Substitute; Equivalence and Proof; Solving Equations; Linear and Non-Linear Graphs; Sequences); Statistics (Statistical Measures).</p>	<ul style="list-style-type: none"> • Developing fluency, reasoning and problem solving are embedded throughout the SoL, rather than treated separately. <p>STRAND(S): Number (Understand and Represent; Calculations; FDP); Algebra (Understand Notation and Substitute; Equivalence and Proof; Solving Equations); R&P (Multiplicative Relationships); G&M (Perimeter, Area and Volume); Statistics (Statistical Measures; Represent and Interpret Data).</p>	<ul style="list-style-type: none"> • Developing fluency, reasoning and problem solving are embedded throughout the SoL, rather than treated separately. <p>STRAND(S): Geometry and Measures (Angles; Shape Properties; Construct and Transform Geometric Figures).</p>	<ul style="list-style-type: none"> • Developing fluency, reasoning and problem solving are embedded throughout the SoL, rather than treated separately. <p>STRAND(S): Probability; Number (Calculations; Understand and Represent); Algebra (Equivalence and Proof).</p>



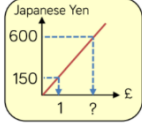
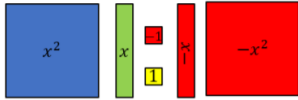
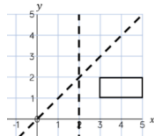
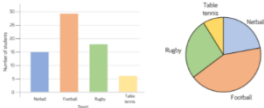
Literacy (including reading)	<ul style="list-style-type: none"> Students will be introduced to the key term 'linear' and this will be applied to sequences and graphical representations. Key terminology outlined throughout as part of Quality First Teaching (QFT). Comprehension style homework tasks integrated into centralised booklets (whole school reading strategy), as well as key word lists in all exercise books. 	<ul style="list-style-type: none"> Key terminology outlined throughout as part of Quality First Teaching (QFT). Comprehension style homework tasks integrated into centralised booklets (whole school reading strategy), as well as key word lists in all exercise books. 	<ul style="list-style-type: none"> Students will learn the basic geometric language, names and properties of types of triangles/quadrilaterals and the names of other polygons. Comprehension style homework tasks integrated into centralised booklets (whole school reading strategy), as well as key word lists in all exercise books. 	<ul style="list-style-type: none"> Students will be introduced to the language of probability and the likelihood of events happening. Comprehension style homework tasks integrated into centralised booklets (whole school reading strategy), as well as key word lists in all exercise books.
Cultural Capital		<ul style="list-style-type: none"> Solve financial mathematical problems linked to bills and bank statements. Solve problems with timetables. Calculating elapsed time. 		<ul style="list-style-type: none"> Know when to apply estimation to check mental calculations. Discuss the probability of events happening.
Social, Moral, Spiritual and Cultural Development	<ul style="list-style-type: none"> In classrooms MWBs are used to help promote self-esteem and build self-confidence. Paired discussions are integrated into lessons on a regular basis and students have the opportunity to work collaboratively and recognise that different learners can have different viewpoints/approaches. Within lessons, respect is encouraged and anything other than this is challenged. Mistakes are welcomed and used as discussion points to address misconceptions. 			
Fundamental British Values	<ul style="list-style-type: none"> A variety of approaches to solving problems are taught and discussed. Students are encouraged to develop strategies that work for them (linked to developing lifelong learners). Students are given a choice of tasks in lessons (e.g. RAG, or Bronze, Silver, Gold), often linked to the Levels of Knowledge. E-safety is promoted through the blended learning opportunities (Google Classroom). 			
Assessment	<ul style="list-style-type: none"> END OF TOPIC BLOCK MINI-ASSESSMENTS (LOW STAKES): Algebraic Thinking: <ol style="list-style-type: none"> Sequences Understand and Use Algebraic Notation Equality and Equivalence Place Value and Proportion: <ol style="list-style-type: none"> Place Value and Ordering Integers and Decimals Fraction, Decimal and Percentage Equivalence SUMMARY ASSESSMENT (December) – Calculator (Core) and Non-Calculator (Tiered). 	<ul style="list-style-type: none"> END OF TOPIC BLOCK MINI-ASSESSMENTS (LOW STAKES): Applications of Number: <ol style="list-style-type: none"> Solving Problems with Addition and Subtraction Solving Problems with Multiplication and Division Fractions and Percentages of Amounts Directed Number: <ol style="list-style-type: none"> Operations and Equations with Directed Number Fractional Thinking: <ol style="list-style-type: none"> Addition and Subtraction of Fractions 	<ul style="list-style-type: none"> END OF TOPIC BLOCK MINI-ASSESSMENTS (LOW STAKES): Lines and Angles: <ol style="list-style-type: none"> Construction and Measuring Geometric Reasoning SUMMARY ASSESSMENT (May) – Calculator (Core) and Non-Calculator (Tiered). 	<ul style="list-style-type: none"> END OF TOPIC BLOCK MINI-ASSESSMENTS (LOW STAKES): Reasoning with Number: <ol style="list-style-type: none"> Developing Number Sense Sets and Probability Prime Numbers and Proof



Key Stage 3 Curriculum Journey: YEAR 8

The curriculum in Mathematics will provide students with opportunities to develop skills linked to numerical thinking, as well as an awareness of the application of numerical, geometric and abstract algebraic concepts. Students will be supported to develop the necessary skills to be able to function in the world as confident, numerate citizens who are able to problem solve in a logical and systematic manner.

THE YEAR 8 CURRICULUM JOURNEY

	HALF TERM 1	HALF TERM 2	HALF TERM 3	HALF TERM 4	HALF TERM 5	HALF TERM 6
Topic and learning focus						
	<p>Proportional Reasoning:</p> <ol style="list-style-type: none"> Ratio and Scale Multiplicative Change Multiplying and Dividing Fractions <p>Representations</p> <ol style="list-style-type: none"> Working in the Cartesian Plane Representing Data Tables and Probability 	<p>Algebraic Techniques:</p> <ol style="list-style-type: none"> Brackets, equations and inequalities Sequences Indices <p>Developing Number</p> <ol style="list-style-type: none"> Fractions and Percentages Standard Index Form Number Sense 	<p>Developing Geometry:</p> <ol style="list-style-type: none"> Angles in Parallel Lines and Polygons Area of Trapezia and Circles Line Symmetry and Reflection 	<p>Reasoning with Data:</p> <ol style="list-style-type: none"> The Data Handling Cycle Measures of Location 		
Foundational Knowledge Prior learning needed	<ul style="list-style-type: none"> The proportional reasoning block looks to enhance what was learnt in KS2 by providing multiple representations to see what underpins the algorithms and procedures. Concepts are interleaved through the term with knowledge build on each time. Building on their knowledge of coordinates from KS2, students will look formally at algebraic rules linked to graphs. Basic graphs and charts work is extended from KS2, here students start to look at bivariate data, as well as discrete and continuous data. The probability topic block builds on the Yr7 block, this term extending the concept to include the probability of multiple events occurring. 	<ul style="list-style-type: none"> Students build on their knowledge of equivalence from Yr7. The sequences block reinforces the knowledge gained during Yr7, extending this to look at sequences with more complex algebraic rules now that students are more familiar with a wider range of notation. Standard form is briefly introduced in Yr7, but here all students formalise the use of standard index form and look at manipulating calculations with numbers given in standard form. The number sense topic block reinforces the basic arithmetic skills learnt in Yr7 by applying them to unfamiliar contexts. 	<ul style="list-style-type: none"> Students need to recall and apply the basic angles facts learned in KS2 Yr7 (around a point, on a straight line and vertically opposite, as well as angle notation). The formulae for calculating the area of a trapezium/circle are now applied in context, where as previously they were used as a substitution example. Students revisit and enhance their knowledge of special triangles and quadrilaterals. 	<ul style="list-style-type: none"> Much of the statistics content in KS3 is a continuation of KS2 studies, however a particular focus this term is on using charts and averages to compare distributions, as well as looking at when charts, graphs or averages can be misleading. Students build on their Yr7 knowledge of finding the median and mean. Concepts are interleaved through the term with knowledge build on each time. 		
Core Knowledge and skills	<ul style="list-style-type: none"> Understand and use ratio notation and understand the link between ratio and multiplication. Use scale factors, linking to ratio, to solve simple direct proportion problems. Multiply and divide fractions by integers and other fractions (using visual/diagram representations). 	<ul style="list-style-type: none"> Expand and factorise into single brackets. Understand the terms expressions, formulae, equations and identities and be able to distinguish between each. Form expressions using indices. 	<ul style="list-style-type: none"> Understand and use parallel lines and angles. Revisit geometric notation. Calculate the area of a trapezium. Calculate the area of a circle. 	<ul style="list-style-type: none"> Understand and use primary and secondary sources of data. Collect data, including using questionnaires. 		



	<ul style="list-style-type: none"> Plot coordinates and extend this to include plotting straight-line graphs. Draw and interpret scatter graphs, understand correlation and draw a line of best fit. 	<ul style="list-style-type: none"> Develop understanding of fractions, decimals and percentages. Read and write numbers in standard index form. Develop mental strategies. Convert between metric measures and units. 	<ul style="list-style-type: none"> Recognise line symmetry in polygons and other shapes. Reflect shapes in horizontal and vertical mirror lines. 	<ul style="list-style-type: none"> Interpret and construct statistical diagrams, including multiple bar charts. Construct and interpret pie charts. Revisit calculating the mean and median, including finding the total when given the mean.
Developmental Knowledge and Skills	<ul style="list-style-type: none"> Simplify ratios, including those involving different units. Write ratios in the form 1:n and n:1. Convert between different currencies, including using conversion graphs. Multiply and divide fractions by integers and other fractions (numerically). Understand and use the equations of a straight line, including lines parallel to the axes. Understand the different types of data (grouped, ungrouped, discrete, continuous). Design and use one and two-way tables, choosing a style which is appropriate for the data set. List outcomes using sample space diagrams. Find probabilities using sample space diagrams and Venn diagrams. 	<ul style="list-style-type: none"> Form and use expressions, formulae and identities. Form and solve equations and inequalities, with and without brackets. Generate sequences using more complex rules both in words and algebraically. Understand and use the addition and subtraction rules for indices. Calculate percentage increase and decrease, including the use of multipliers. Express one number as a percentage of another number. Compare numbers given in standard index form. Estimate, including recapping how to round to one significant figure. Apply the order of operations in a range of contexts. 	<ul style="list-style-type: none"> Solve angle problems where the properties of quadrilaterals need to be applied. Find and use the sum of interior and exterior angles in polygons. Prove simple geometric facts. Calculate the area of parts of circle (using an awareness of fractions of amounts). Use significant figures in a variety of contexts (specifically linked to geometry). Reflect shapes in diagonal mirror lines. 	<ul style="list-style-type: none"> Identify misleading graphs. Compare distributions using charts and measures. Find the mean of grouped data. Work out the mode and modal class. Choose the appropriate average.
Complex Knowledge	<ul style="list-style-type: none"> Apply knowledge of equivalent ratios to solve problems, including calculating the circumference of a circle and the gradient of a line segment. Draw and interpret scale diagrams and maps. Explore the properties of direct proportion graphs. Understand and use the reciprocal. Multiply and divide mixed numbers, as well as simple algebraic fractions. Model situations by translating them into expressions, formulae and graphs. Explore non-linear graphs. Use the product rule for counting. 	<ul style="list-style-type: none"> Expand a pair of binomials. Solve equations and inequalities with unknowns on both sides. Find the rule for the nth term of a linear sequence. Explore powers of powers. Find the original value given a percentage change (reverse percentage problems). Calculate with numbers given in standard index form (calculator and non-calculator methods). Understand and use surd notation. Understand and use negative and simple fractional indices. Convert between units of area and volume. Use error interval notation. 	<ul style="list-style-type: none"> Understand and use the properties of diagonals of quadrilaterals. Perform standard constructions including perpendiculars. Calculate the area of compound shapes and solve problems. 	<ul style="list-style-type: none"> Explore histograms for unequal groups. Find unknown data values given the mean or changes in the mean. Find the median from a table of values.
Links with the National Curriculum	<ul style="list-style-type: none"> Developing fluency, reasoning and problem solving are embedded throughout the SoL, rather than treated separately. 	<ul style="list-style-type: none"> Developing fluency, reasoning and problem solving are embedded throughout the SoL, rather than treated separately. 	<ul style="list-style-type: none"> Developing fluency, reasoning and problem solving are embedded throughout the SoL, rather than treated separately. 	<ul style="list-style-type: none"> Developing fluency, reasoning and problem solving are embedded throughout the SoL, rather than treated separately.



	STRAND(S): Number (Calculations); Algebra (Linear and Non-Linear Graphs); R&P (Multiplicative Relationships; Ratio and Rates); G&M (Perimeter, Area and Volume; Construct and Transform Geometric Figures); Statistics (Bivariate Data; Represent and Interpret Data); Probability.	STRAND(S): Number (Understand and Represent; Calculations; FDP); Algebra (Understand Notation and Substitute; Equivalence and Proof; Solving Equations and Inequalities; Sequences); R&P (Multiplicative Relationships).	STRAND(S): G&M (Perimeter, Area and Volume; Construct and Transform Geometric Figures; Shape Properties; Angles; Geometric Proof).	STRAND(S): Statistics (Statistical Measures; Represent and Interpret Data).
Literacy (including reading)	<ul style="list-style-type: none"> • Key terminology outlined throughout as part of Quality First Teaching (QFT). • The terminology of proportion is produced this term and the language of probability is revisited from Yr7 and built upon in the context of multiple events occurring simultaneously. • Comprehension style homework tasks integrated into centralised booklets (whole school reading strategy), as well as key word lists in all exercise books. 	<ul style="list-style-type: none"> • Key terminology outlined throughout as part of Quality First Teaching (QFT). • Comprehension style homework tasks integrated into centralised booklets (whole school reading strategy), as well as key word lists in all exercise books. 	<ul style="list-style-type: none"> • Key terminology outlined throughout as part of Quality First Teaching (QFT). • Key vocabulary such as object, image and congruent are introduced when looking at reflections. • Comprehension style homework tasks integrated into centralised booklets (whole school reading strategy), as well as key word lists in all exercise books. 	<ul style="list-style-type: none"> • Key terminology outlined throughout as part of Quality First Teaching (QFT). • Design and carry out statistical studies, including the use of questionnaires. • Comprehension style homework tasks integrated into centralised booklets (whole school reading strategy), as well as key word lists in all exercise books.
Cultural Capital	<ul style="list-style-type: none"> • Interpret scales and maps; use proportion and scaling to re-write recipes or calculate best value for money. • Discuss the probability of events happening. • Interpret and use a variety of statistical representations and consider the limitations these can have for portraying accurate data. 	<ul style="list-style-type: none"> • Convert between metric measures. • Use standard index form for scientific data, as well as appreciate the significance of standard index form when working with very large and small numbers. 	<ul style="list-style-type: none"> • Recognise the beauty in pattern making and symmetrical patterns. 	<ul style="list-style-type: none"> • Design and carry out statistical studies, including the use of questionnaires. • Consider the pros and cons of using a variety of charts and tables to display data, including consideration of misleading data.
Social, Moral, Spiritual and Cultural Development	<ul style="list-style-type: none"> • In classrooms MWBs are used to help promote self-esteem and build self-confidence. • Paired discussions are integrated into lessons on a regular basis and students have the opportunity to work collaboratively and recognise that different learners can have different viewpoints/approaches. • Within lessons, respect is encouraged and anything other than this is challenged. Mistakes are welcomed and used as discussion points to address misconceptions. 			
Fundamental British Values	<ul style="list-style-type: none"> • A variety of approaches to solving problems are taught and discussed. Students are encouraged to develop strategies that work for them (linked to developing lifelong learners). • Students are given a choice of tasks in lessons (e.g. RAG, or Bronze, Silver, Gold), often linked to the Levels of Knowledge. • E-safety is promoted through the blended learning opportunities (Google Classroom). 			
Assessment	<ul style="list-style-type: none"> • END OF TOPIC BLOCK MINI-ASSESSMENTS (LOW STAKES): Proportional Reasoning: 1. Ratio and Scale 2. Multiplicative Change 3. Multiplying and Dividing Fractions Representations 1. Working in the Cartesian Plane 2. Representing Data 3. Tables and Probability 	<ul style="list-style-type: none"> • END OF TOPIC BLOCK MINI-ASSESSMENTS (LOW STAKES): Algebraic Techniques: 1. Brackets, equations and inequalities 2. Sequences 3. Indices Developing Number 1. Fractions and Percentages 2. Standard Index Form 3. Number Sense 	<ul style="list-style-type: none"> • END OF TOPIC BLOCK MINI-ASSESSMENTS (LOW STAKES): Developing Geometry: 1. Angles in Parallel Lines and Polygons 2. Area of Trapezia and Circles 3. Line Symmetry and Reflection SUMMARY ASSESSMENT (May) – Calculator (Core) and Non-Calculator (Tiered). 	<ul style="list-style-type: none"> • END OF TOPIC BLOCK MINI-ASSESSMENTS (LOW STAKES): Reasoning with Data: 1. The Data Handling Cycle 2. Measures of Location



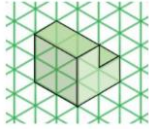
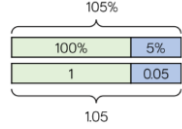
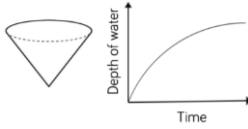
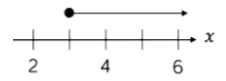
	• SUMMARY ASSESSMENT (November) – Calculator (Core) and Non-Calculator (Tiered).			
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Key Stage 3 Curriculum Journey: YEAR 9

The curriculum in Mathematics will provide students with opportunities to develop skills linked to numerical thinking, as well as an awareness of the application of numerical, geometric and abstract algebraic concepts. Students will be supported to develop the necessary skills to be able to function in the world as confident, numerate citizens who are able to problem solve in a logical and systematic manner.

THE YEAR 9 CURRICULUM JOURNEY

	HALF TERM 1	HALF TERM 2	HALF TERM 3	HALF TERM 4	HALF TERM 5	HALF TERM 6
Topic and learning focus						
	<p>Reasoning with Algebra:</p> <ol style="list-style-type: none"> 1. Straight Line Graphs 2. Forming and Solving Equations 3. Testing Conjectures <p>Constructing in 2 and 3 Dimensions:</p> <ol style="list-style-type: none"> 1. 3D Shapes 2. Constructions and Congruence 		<p>Reasoning with Number:</p> <ol style="list-style-type: none"> 1. Numbers 2. Using Percentages 3. Mathematics and Money <p>Reasoning with Geometry:</p> <ol style="list-style-type: none"> 1. Deduction 2. Rotation and Translation 3. Pythagoras' Theorem 		<p>Reasoning with Proportion:</p> <ol style="list-style-type: none"> 1. Enlargement and Similarity 2. Solving Ratio and Proportion Problems 3. Rates 	<p>Representations:</p> <ol style="list-style-type: none"> 1. Probability 2. Algebraic Representation
Foundational Knowledge Prior learning needed	<ul style="list-style-type: none"> • The graph work builds on the Yr8 content where students are introduced to plotting straight-line graphs. • Students revisit and extend their knowledge of forming and solving linear equations and inequalities, in particular looking at relating this to other strands. • Concepts are interleaved through the term with knowledge build on each time. • This is the first time 3D shapes are formally introduced at KS3 so students will need reminding of key vocabulary. • The knowledge and skills learned in Yr7/8 linked to angle construction and ruler/protractor proficiency is more formally applied here, including in the context of loci. 		<ul style="list-style-type: none"> • Students revisit and build on their knowledge or mental and written arithmetic methods, as well as their understanding of factors, multiples and standard index form. • Students build of the percentages work from Yr8 where they were introduced to multipliers, this time realising the benefits of multipliers when working with reverse percentages, as well as repeated percentage change. • Students practise their number skills in various financial contexts. The language of financial mathematics introduced in Yr7/8 is further developed. • Students need to recall and then apply their knowledge of squares and roots when looking at Pythagoras' theorem. 		<ul style="list-style-type: none"> • Students develop their knowledge of transformations to include enlargement, learning the mathematical meaning of the work similar. • Students build on their knowledge of inverse relationships to explore speed, distance and time in detail. • In the ratio and proportion topic, students build on their previously learned skills and apply their knowledge to graphical representations. 	<ul style="list-style-type: none"> • Students build on their probability work from Yr7/8 to include calculating the probability of single and combined events. • Students extend their knowledge of graphs to look at interpretation and creation of different types of graphs, specifically non-linear graphs.
Core Knowledge and skills	<ul style="list-style-type: none"> • Interpret straight-line graphs. • Find and use the equation of a straight line. • Revisit and extend the concept of forming and solving equations and inequalities, including with unknowns on both sides. 		<ul style="list-style-type: none"> • Revisit types of number, including numbers written in standard index form. Extend to include real and rational numbers. • Revisit fraction arithmetic. • Extend knowledge of HCF and LCM. 		<ul style="list-style-type: none"> • Enlarge shapes by a positive scale factor, including from a given point. • Calculate the lengths of missing side lengths in similar shapes. 	<ul style="list-style-type: none"> • Calculate relative frequency and expected outcomes. • Represent inequalities on a number line.



	<ul style="list-style-type: none"> Understand the language linked to naming and describing properties of shapes. Identify 2D shapes within 3D shapes. 	<ul style="list-style-type: none"> Revisit percentages, including calculating percentage increase and decrease using multipliers. Revisit angle rules, including with special triangles and quadrilaterals. Identify the order or rotational symmetry of a shape. Find the result of rotating a shape. Translate points and shapes by a given vector. Identify the hypotenuse of a right-angled triangle. 	<ul style="list-style-type: none"> Solve direct proportion problems and apply this to graphical representations. Use conversion graphs. Solve ratio problems given the whole, or a part. Work with speed, distance and time and understand the fact that speed is a compound measure. Solve problems involving density. 	
Developmental Knowledge and Skills	<ul style="list-style-type: none"> Reduce equations to the form $y=mx+c$. Compare to linear sequences and finding the rule for the nth term. Set up and solve equations and inequalities using all previous contexts (angles, probabilities area etc.) Change the subject of a formula. Test conjectures in a wide range of contexts. Work out the volume and surface area of cuboids, cylinders and prisms. Construct 3D shapes from nets and construct the net of a 3D shape. Construct and use scale drawings. Construct perpendicular bisectors. Understand congruency and explore the congruency conditions through constructions. 	<ul style="list-style-type: none"> Find percentage changes and work with percentages greater than 100%. Solve reverse percentage problems. Explore financial mathematics including bills and bank statements, interest and unit pricing. Apply algebraic techniques to find missing angles. Understand variance and invariance in the context of transformations. Determine whether a triangle is right-angled. Calculate missing sides in right-angled triangles. 	<ul style="list-style-type: none"> Enlarge shapes by a negative scale factor. Calculate unit pricing and then use this to identify best value for money. Work with compound units where problems are given in real-life contexts, or as part of multi-step worded problems. 	<ul style="list-style-type: none"> Use tree diagrams to show outcomes from more than one event (that occur independently). Draw and interpret quadratic graphs. Interpret piece-wise and reciprocal graphs.
Complex Knowledge	<ul style="list-style-type: none"> Solve a pair of simultaneous equations using graphical methods. Change the subject of a complex formula, including when the subject appears more than once. Explore the gradients of perpendicular lines. Work out missing lengths given areas/volumes. Explore volumes of cones, spheres and compound 3D shapes. Work out the surface area of any prism. Explore the locus of a path. 	<ul style="list-style-type: none"> Work with repeated percentage change, including comparisons of interest rates. Use chains of reasoning to evaluate angles. Develop more complex geometrical proofs. Find the result of a series of transformations. Explore formal proofs of Pythagoras' theorem, as well as apply Pythagoras' theorem to 3D shapes. 	<ul style="list-style-type: none"> Explore ratios in right-angled triangles. Explore inverse proportion, including graphical representations. Convert compound measures. 	<ul style="list-style-type: none"> Use tree diagrams to solve 'without replacement' problems. Investigate graphs of simultaneous equations.
Links with the National Curriculum	<ul style="list-style-type: none"> Developing fluency, reasoning and problem solving are embedded throughout the SoL, rather than treated separately. <p>STRAND(S): Algebra (Understand Notation and Substitute; Equivalence and Proof; Solve Equations and Inequalities; Linear Graphs; Sequences); R&P (Multiplicative Relationships); G&M (Perimeter, Area</p>	<ul style="list-style-type: none"> Developing fluency, reasoning and problem solving are embedded throughout the SoL, rather than treated separately. <p>STRAND(S): Number (Understand and Represent; Calculations; Understand FDP); R&P (Ratio and Rates); G&M (Construct and Transform Geometric Figures; Angles; Pythagoras and Trigonometry; Geometric Proof).</p>	<ul style="list-style-type: none"> Developing fluency, reasoning and problem solving are embedded throughout the SoL, rather than treated separately. <p>STRAND(S): R&P (Multiplicative Relationships; Ratio and Rates); G&M (Pythagoras and Trigonometry).</p>	<ul style="list-style-type: none"> Developing fluency, reasoning and problem solving are embedded throughout the SoL, rather than treated separately. <p>STRAND(S): Number (Understand and Represent); Algebra (Understand Notation and Substitute; Equivalence and Proof);</p>



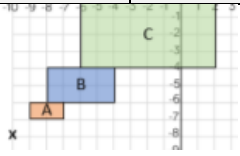
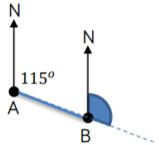
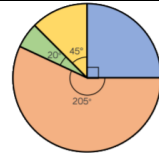
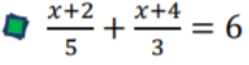
	and Volume; Construct and Transform Geometric Figures; Shape Properties; Geometric Proof).			Solve Equations and Inequalities; Linear and Non-Linear Graphs; Sequences); Probability; Statistics (Represent and Interpret Data).
Literacy (including reading)	<ul style="list-style-type: none"> • Key terminology outlined throughout as part of Quality First Teaching (QFT). • Understand the language of faces, edges and vertices. • Know the names of common prisms and non-prisms (e.g. spheres, cones, pyramids). • Comprehension style homework tasks integrated into centralised booklets (whole school reading strategy), as well as key word lists in all exercise books. 	<ul style="list-style-type: none"> • Key terminology outlined throughout as part of Quality First Teaching (QFT). • The language of financial mathematics introduced in Yr7/8 is further developed. • Comprehension style homework tasks integrated into centralised booklets (whole school reading strategy), as well as key word lists in all exercise books. 	<ul style="list-style-type: none"> • Key terminology outlined throughout as part of Quality First Teaching (QFT). • Appreciation of where units derive from when looking at compound measures, e.g. mph. • Comprehension style homework tasks integrated into centralised booklets (whole school reading strategy), as well as key word lists in all exercise books. 	<ul style="list-style-type: none"> • Key terminology outlined throughout as part of Quality First Teaching (QFT). • Comprehension style homework tasks integrated into centralised booklets (whole school reading strategy), as well as key word lists in all exercise books.
Cultural Capital	<ul style="list-style-type: none"> • Nets and packaging, including consideration of waste. 	<ul style="list-style-type: none"> • Recognise the beauty in pattern making and mathematical diagrams made from translations/rotations. • Solve financial mathematical problems linked to bills and bank statements. Financial capability and budgeting, including VAT and interest rates. 	<ul style="list-style-type: none"> • Interpret scales and maps; use proportion and scaling to re-write recipes or calculate best value for money. • Currencies and exchange rates. • Compound measures linked to speed and density. 	<ul style="list-style-type: none"> • Discuss the probability of events happening. • Interpret and use a variety of statistical representations and consider the limitations these are can have for portraying accurate data.
Social, Moral, Spiritual and Cultural Development	<ul style="list-style-type: none"> • In classrooms MWBs are used to help promote self-esteem and build self-confidence. • Paired discussions are integrated into lessons on a regular basis and students have the opportunity to work collaboratively and recognise that different learners can have different viewpoints/approaches. • Within lessons, respect is encouraged and anything other than this is challenged. Mistakes are welcomed and used as discussion points to address misconceptions. 			
Fundamental British Values	<ul style="list-style-type: none"> • A variety of approaches to solving problems are taught and discussed. Students are encouraged to develop strategies that work for them (linked to developing lifelong learners). • Students are given a choice of tasks in lessons (e.g. RAG, or Bronze, Silver, Gold), often linked to the Levels of Knowledge. • E-safety is promoted through the blended learning opportunities (Google Classroom). 			
Assessment	<ul style="list-style-type: none"> • END OF TOPIC BLOCK MINI-ASSESSMENTS (LOW STAKES): Reasoning with Algebra: 1. Straight Line Graphs 2. Forming and Solving Equations 3. Testing Conjectures Constructing in 2 and 3 Dimensions: 1. 3D Shapes 2. Constructions and Congruence 	<ul style="list-style-type: none"> • END OF TOPIC BLOCK MINI-ASSESSMENTS (LOW STAKES): Reasoning with Number: 1. Numbers 2. Using Percentages 3. Mathematics and Money Reasoning with Geometry: 1. Deduction 2. Rotation and Translation 3. Pythagoras' Theorem <p>SUMMARY ASSESSMENT (January) – Calculator (Core) and Non-Calculator (Tiered).</p>	<ul style="list-style-type: none"> • END OF TOPIC BLOCK MINI-ASSESSMENTS (LOW STAKES): Reasoning with Proportion: 1. Enlargement and Similarity 2. Solving Ratio and Proportion Problems 3. Rates 	<ul style="list-style-type: none"> • END OF TOPIC BLOCK MINI-ASSESSMENTS (LOW STAKES): Representations: 1. Probability 2. Algebraic Representation <p>SUMMARY ASSESSMENT (June) – Calculator (Core) and Non-Calculator (Tiered).</p>



Key Stage 4 Curriculum Journey: YEAR 10

The curriculum in Mathematics will provide students with opportunities to develop skills linked to numerical thinking, as well as an awareness of the application of numerical, geometric and abstract algebraic concepts. Students will be supported to develop the necessary skills to be able to function in the world as confident, numerate citizens who are able to problem solve in a logical and systematic manner.

THE YEAR 10 CURRICULUM JOURNEY

	HALF TERM 1	HALF TERM 2	HALF TERM 3	HALF TERM 4	HALF TERM 5	HALF TERM 6
Topic and learning focus						
	<p>Similarity:</p> <ol style="list-style-type: none"> 1. Congruence, Similarity and Enlargement 2. Trigonometry <p>Developing Algebra:</p> <ol style="list-style-type: none"> 1. Representing Solutions of Equations and Inequalities 2. Simultaneous Equations 		<p>Geometry:</p> <ol style="list-style-type: none"> 1. Angles and Bearings 2. Working with Circles 3. Vectors <p>Proportions and Proportional Change</p> <ol style="list-style-type: none"> 1. Ratios and Fractions 2. Percentages and Interest 3. Probability 		<p>Delving into Data:</p> <ol style="list-style-type: none"> 1. Collecting, Representing and Interpreting Data <p>Using Number:</p> <ol style="list-style-type: none"> 1. Non-Calculator Methods 	<p>Using Number:</p> <ol style="list-style-type: none"> 1. Types of Number and Sequences 2. Indices and Roots (or Autumn Yr11) <p>Expressions:</p> <ol style="list-style-type: none"> 1. Manipulating Expressions (or Autumn Yr11)
Foundational Knowledge Prior learning needed	<ul style="list-style-type: none"> • The similarity topic block builds on prior experience at KS3 of looking at enlargement and similarity, formally introducing the concept of similar and congruent triangles. • Trigonometry is introduced as a special case of similarity and emphasis is placed on linking the trig functions to ratios. • Students will have covered both equations and inequalities at KS3, however this topic block offers the opportunity to revisit and reinforce standard techniques and deepen understanding. 		<ul style="list-style-type: none"> • Students have the opportunity here to review KS3 work on calculating missing angles, as well as calculate the area and circumference of a circle. This is then built on when considering bearing problems. • Students will need to apply their knowledge of fractions and fractions of amounts when working with sectors. • Students will have met vectors to describe translation during KS3. This will be revisited and used as the basis for looking more formally at vectors and vector 'journeys'. • KS3 work on ratios and fractions is built on, highlighting similarities and difference, as well as links to others area of maths, inc. both algebra and geometry. • Although percentages are not specifically mentioned in the KS4 NC, they feature heavily in examinations and hence this topic block builds on knowledge gained at KS3. 		<ul style="list-style-type: none"> • Students build on their KS3 work on the collecting, representing and the use of summary statistics to describe data sets. Much of the content is familiar, but there is an increased emphasis on the interpretation of data and making comparisons. • The 'Non-Calculator Methods' topic block revises and build on KS3 content for calculation. Mental, as well as formal methods are encouraged and this is taught through increasingly difficult problem solving scenarios, assuming the fundamental skills are in place from KS3. 	<ul style="list-style-type: none"> • Students extend their KS3 work on number and sequences, reviewing prime factorisation and associated number work such as HCF and LCM. • The final topic block build on the Autumn term learning of equations and inequalities, providing revision and reinforcement, as well as an introduction to algebraic fractions. Students will need to be proficient in numerical fraction arithmetic.
Core Knowledge and skills	<ul style="list-style-type: none"> • Understand the difference between congruence and similarity. • Understand trigonometric ratios. 		<ul style="list-style-type: none"> • Understand and use bearings. 		<ul style="list-style-type: none"> • Understand sampling and carry out samples (inc. stratified). 	<ul style="list-style-type: none"> • Use factors, multiples, primes and prime factorisation.



	<ul style="list-style-type: none"> • Know and use the exact values of key angles. • Form and solve equations and inequalities in a variety of contexts, including with unknowns on both sides. • Represent solutions to inequalities on a number line. • Represent solutions to equations graphically. • Understand the meaning on solution, appreciating that sometimes equations have multiple solutions. 	<ul style="list-style-type: none"> • Name parts of a circle and perform related calculations, e.g. calculating the area of a sector and the arc length of a sector. • Understand vector notation. • Understand and apply ratio notation. • Understand and apply the relationship between fractions and ratios in a variety of contexts. • Convert fluently between fractions, decimals and percentages. • Calculate percentages of amounts, as well as percentage increase and decrease. • Express one value as a fraction or percentage of another. • Review the language of probability and recall how to calculate the probability of single events. • Understand and work with mutually exclusive and independent events. 	<ul style="list-style-type: none"> • Construct and interpret tables and line graphs for time series data. • Understand and represent with grouped data. • Understand and identify correlation. • Construct and interpret frequency polygons. • Use the four operations with integers, decimals and fractions. 	<ul style="list-style-type: none"> • Recognise and use arithmetic and geometric sequences. • Calculate powers and roots. • Apply the laws of indices when simplifying expressions containing indices. • Recall how to interpret standard index form. • Simplify algebraic expressions and use identities.
Developmental Knowledge and Skills	<ul style="list-style-type: none"> • Enlarge a shape about a given point, understanding the link to similarity. • Find missing sides in similar shapes. • Understand and use the conditions for a pair of congruent triangles. • Calculate the area and volume of similar shapes. • Work out missing lengths and angles in right-angled triangles. • Use the formula $\frac{1}{2}ab\sin C$ to calculate the area of non-right angled triangles. • Form and solve a pair of linear simultaneous equations algebraically and graphically. 	<ul style="list-style-type: none"> • Calculate the area and volume of shapes involving circles, inc. spheres, cylinders, cones. • Use vectors in arithmetic calculations (adding, subtracting and multiplying by a scalar). • Recall the link between vectors and translations. • Apply the first four circle theorems to calculate missing angles inside circles. • Apply knowledge of ratios and equivalent ratios to solve problems, including calculating best value for money, as well as working with converting currencies. • Calculate simple and compound interest, as well as evaluate exponential change, e.g. depreciation. • Solve reverse percentage problems in context. • Construct and interpret tree diagrams. • Find probabilities from frequency trees, tables and Venn diagrams. 	<ul style="list-style-type: none"> • Use lines of best fit and understand the dangers of extrapolation. • Evaluate measures of location and dispersion. • Use statistical diagrams and measures to compare distributions. • Construct and interpret cumulative frequency diagrams, box-plots and histograms. • Understand quartiles; use and interpret the interquartile range. • Solve multi-step problems requiring proficiency with the four operations on integers, decimals and fractions. • Work with exact answers, e.g. area and volume. • Evaluate calculations involving percentages. 	<ul style="list-style-type: none"> • Recognise and use other sequences. • Find the rule for the nth term of a quadratic sequence. • Calculate with numbers given in standard index form. • Perform the four operations with algebraic fractions.
Complex Knowledge	<ul style="list-style-type: none"> • Formulate proofs for congruent triangles. • Enlarge a shape by a negative scale factor. • Use trigonometry in 3D shapes. • Derive and use the sine and cosine rule. • Use set notation for solutions. • Solve inequalities in two variables, identifying regions on graphs. • Solve quadratic equations and inequalities by factorising. 	<ul style="list-style-type: none"> • Derive and prove the first four circle theorems. • Understand and use the equation of a circle. • Construct geometric proofs with vectors and formulate/describe vector journeys. • Combine ratios. • Use iterative methods. • Calculate and interpret conditional probabilities. 	<ul style="list-style-type: none"> • Understand and be able to articulate the limitations of sampling methods, as well as the risks of using certain data representations in terms of providing misleading information. • Calculate with surds. 	<ul style="list-style-type: none"> • Understand and use fractional indices. • Work with rational and irrational numbers, including recurring decimals. • Work with limits of accuracy, including upper and lower bounds. • Solve equations involving algebraic fractions.



	<ul style="list-style-type: none"> Solve simultaneous equations with one linear and one quadratic. 			
Links with the National Curriculum	<ul style="list-style-type: none"> Developing fluency, reasoning and problem solving are embedded throughout the SoL, rather than treated separately. <p>STRAND(S): Algebra (Understand Notation and Substitute; Equivalence and Proof; Solve Equations and Inequalities; Linear and Non-Linear Graphs); R&P (Multiplicative Relationships); G&M (Construct and Transform Geometric Figures; Shape Properties; Pythagoras and Trigonometry; Geometric Proof).</p>	<ul style="list-style-type: none"> Developing fluency, reasoning and problem solving are embedded throughout the SoL, rather than treated separately. <p>STRAND(S): Number (Understand Fractions, Decimals and Percentages); R&P (Multiplicative Relationships; Ratio and Rates); G&M (Perimeter, Area and Volume; Construct and Transform Geometric Figures; Shape Properties; Angles; Pythagoras and Trigonometry; Geometric Proof); Probability.</p>	<ul style="list-style-type: none"> Developing fluency, reasoning and problem solving are embedded throughout the SoL, rather than treated separately. <p>STRAND(S): Number (Understand and Represent; Calculations; Percentages); G&M (Perimeter, Area and Volume); Statistics (Represent and Interpret Data; Statistical Measures; Bivariate Data).</p>	<ul style="list-style-type: none"> Developing fluency, reasoning and problem solving are embedded throughout the SoL, rather than treated separately. <p>STRAND(S): Number (Understand and Represent; Calculations); Algebra (Understand Notation and Substitute; Equivalence and Proof; Sequences).</p>
Literacy (including reading)	<ul style="list-style-type: none"> Key terminology outlined throughout as part of Quality First Teaching (QFT). Know the difference between congruence and similarity. The language of set notation is formally discussed, as well as the language linked to inequalities. Comprehension style homework tasks integrated into centralised booklets (whole school reading strategy), as well as key word lists in all exercise books. 	<ul style="list-style-type: none"> Key terminology outlined throughout as part of Quality First Teaching (QFT). * Use of financial contexts is embedded through the percentages work, helping students to maintain familiarity with the vocabulary they are likely to hear outside of school. Comprehension style homework tasks integrated into centralised booklets (whole school reading strategy), as well as key word lists in all exercise books. 	<ul style="list-style-type: none"> Key terminology outlined throughout as part of Quality First Teaching (QFT). Students learn about the limitations of sampling methods and can articulate this in the context of real-life scenarios. Comprehension style homework tasks integrated into centralised booklets (whole school reading strategy), as well as key word lists in all exercise books. 	<ul style="list-style-type: none"> Key terminology outlined throughout as part of Quality First Teaching (QFT). Comprehension style homework tasks integrated into centralised booklets (whole school reading strategy), as well as key word lists in all exercise books.
Cultural Capital	<ul style="list-style-type: none"> Discussions about the origins of the trigonometric ratios and the historical developments around this. Scale drawings and modelling, including consideration of architecture and careers which rely on accurate scaled diagrams/representations. 	<ul style="list-style-type: none"> *Use of financial contexts is embedded through the percentages work (see above). Awareness of bearings and their use in aviation and navigation. 	<ul style="list-style-type: none"> Interpret and use a variety of statistical representations and consider the limitations these are can have for portraying accurate data. 	<ul style="list-style-type: none"> Understanding that limits of accuracy are used to interpret and define error intervals.
Social, Moral, Spiritual and Cultural Development	<ul style="list-style-type: none"> In classrooms MWBs are used to help promote self-esteem and build self-confidence. Paired discussions are integrated into lessons on a regular basis and students have the opportunity to work collaboratively and recognise that different learners can have different viewpoints/approaches. Within lessons, respect is encouraged and anything other than this is challenged. Mistakes are welcomed and used as discussion points to address misconceptions. A variety of approaches to solving problems are taught and discussed. Students are encouraged to develop strategies that work for them (linked to developing lifelong learners). Students are given a choice of tasks in lessons (e.g. RAG, or Bronze, Silver, Gold), often linked to the Levels of Knowledge. E-safety is promoted through the blended learning opportunities (Google Classroom). 			
Fundamental British Values				
Assessment	<ul style="list-style-type: none"> END OF TOPIC BLOCK MINI-ASSESSMENTS (LOW STAKES): Similarity: 1. Congruence, Similarity and Enlargement 2. Trigonometry Developing Algebra: 1. Representing Solutions of Equations and Inequalities 2. Simultaneous Equations 	<ul style="list-style-type: none"> END OF TOPIC BLOCK MINI-ASSESSMENTS (LOW STAKES): Geometry: 1. Angles and Bearings 2. Working with Circles 3. Vectors Proportions and Proportional Change 1. Ratios and Fractions 2. Percentages and Interest 	<ul style="list-style-type: none"> END OF TOPIC BLOCK MINI-ASSESSMENTS (LOW STAKES): 1. Collecting, Representing and Interpreting Data Using Number: 1. Non-Calculator Methods 	<ul style="list-style-type: none"> END OF TOPIC BLOCK MINI-ASSESSMENTS (LOW STAKES): Using Number: 1. Types of Number and Sequences 2. Indices and Roots (or Autumn Yr11) Expressions:



3. Probability

SUMMARY ASSESSMENT (February) – Calculator (Tiered) and Non-Calculator (Tiered).

1. Manipulating Expressions (or Autumn Yr11)

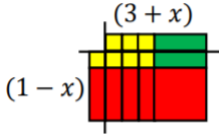
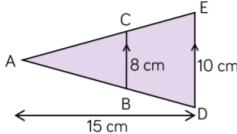

SUMMARY ASSESSMENT (July) – Calculator (Tiered) and Non-Calculator (Tiered).



Key Stage 4 Curriculum Journey: YEAR 11

The curriculum in Mathematics will provide students with opportunities to develop skills linked to numerical thinking, as well as an awareness of the application of numerical, geometric and abstract algebraic concepts. Students will be supported to develop the necessary skills to be able to function in the world as confident, numerate citizens who are able to problem solve in a logical and systematic manner.

THE YEAR 11 CURRICULUM JOURNEY

	HALF TERM 1	HALF TERM 2	HALF TERM 3	HALF TERM 4	HALF TERM 5	HALF TERM 6
Topic and learning focus						
	<ol style="list-style-type: none"> Indices and roots Manipulating expressions Gradients and lines Non-linear graphs Using graphs 	<ol style="list-style-type: none"> Expanding and factorising Changing the subject Functions Multiplicative reasoning Geometric reasoning Algebraic reasoning 	<ol style="list-style-type: none"> Expanding and factorising Changing the subject Functions Multiplicative reasoning Geometric reasoning Algebraic reasoning 	<ol style="list-style-type: none"> Transforming and constructing Listing and describing 'Show that...' 		
Foundational Knowledge Prior learning needed	<ul style="list-style-type: none"> Recognise square and cube numbers. Recall what it means for terms to be like and unlike and recognise when expressions can be simplified. Recall how to expand single brackets. Recall how to plot straight line graphs using knowledge of the gradient/intercept, or from a table of values, including those parallel to the axes. Recall how to interpret $y = mx + c$ Recognise graph shapes. Recall how to reflect shapes in given lines. Construct and interpret conversion graphs. Recall how to construct and interpret other real life straight line graphs (specifically linear relationships that do not pass through the origin). 	<ul style="list-style-type: none"> Recall how to expand and factorise with a single bracket. Recall how to expand binomials. Recall how to solve linear equations and inequalities in a variety of contexts. Recall how to recognise the subject of a formula. Recall how to change the subject of a simple one or two-step formula. Recall how to use function machines to calculate inputs and outputs. Recall how to substitute values into expressions and formulae. Recall how to calculate and use scale factors within similar shapes. Recall what direct proportion is and be able to recognise when two quantities are in direct proportion. This could be within a word problem, on a graph, or in an equation. Recall the rules related to calculating angles around a point. Recall how to identify alternate, corresponding and co-interior angles. Recall how to find the rule for the n^{th} term of a linear sequence. Simplify algebraic expressions by collecting like terms. 	<ul style="list-style-type: none"> Recall how to perform and describe line symmetry and reflection; rotation and rotational symmetry; translations of shapes by vectors; enlargements by a positive or fractional scale factor (no centre of enlargement). Recall how to generate a list systematically. The work in these topic blocks acts as a vehicle to expose students to the wide range of command words present in examination questions, as well as recap a variety of skills in context. 			



		<ul style="list-style-type: none"> • Recall how to apply the laws of indices when simplifying expressions. 		
<p>Core Knowledge and skills</p>	<ul style="list-style-type: none"> • Calculate higher powers and roots. • Apply the laws of indices when simplifying expressions containing indices. • Recall how to interpret standard index form. • Simplify algebraic expressions and use identities. • Understand the difference between equality and equivalence. • Understand, find and use the equation of a straight line graph (when given the line on a set of axes). • Determine whether a point lies on a line. • Plot and read from quadratic graphs. • Plot and read from cubic graphs. • Plot and read from reciprocal graphs. • Read and interpret distance time graphs. • Construct distance time graphs. • Recognise and interpret graphs that illustrate direct and inverse proportion. 	<ul style="list-style-type: none"> • Factorise quadratic expressions (of the form $x^2 + ax + b$) • Form and solve equations equal to zero. • Form and solve quadratic equations by factorising (of the form $x^2 + ax + b$) • Recall how to form and solve linear equations and inequalities in a variety of contexts. • Change the subject of a more complex formula where the subject appears once. • Use function notation. • Understand and use the trigonometric functions. • Recognise and plot the graph of a quadratic function, as well as estimate solutions and identify the coordinates of the turning point. • Recall what inverse proportion is and be able to recognise when two quantities are inversely proportional. • Calculate with pressure and density. • Calculate angles involving parallel lines and a transversal and be able to form chains of reasoning linked to angles in parallel lines. • Recall how to calculate interior and exterior angles in polygons. • Apply knowledge of angles to prove simple geometric facts. • Recall how to draw and understand vectors in arithmetic calculations (adding, subtracting and multiplying by a scalar). • Solve linear simultaneous equations. 	<ul style="list-style-type: none"> • Recall how to enlarge and describe the enlargement of a shape by a positive or fractional scale factor (when a centre of enlargement is given). • Perform and describe a series of transformations of shapes. • Perform standard constructions using ruler and protractor or ruler and compasses. • Recall how to use sample spaces within probability questions. • Recall how to complete and use Venn diagrams, as well as understand set notation. • Recall how to construct and interpret plans and elevations. • Recall how to draw and interpret scatter diagrams. 	
<p>Developmental Knowledge and Skills</p>	<ul style="list-style-type: none"> • Calculate with numbers written in standard index form. • Understand and use the power of zero, as well as negative indices. • Add, subtract, multiply and divide algebraic fractions (H). • Form and solve equations and inequalities with fractions. • Represent numbers algebraically in preparation for formulating proofs. • Find the equation of a straight line (as well as parallel lines), given one point and the gradient, or given two points. • Solve linear simultaneous equations graphically. • Identify and interpret roots and intercepts of quadratics. • Understand and use exponential graphs (H). • Construct and interpret speed time graphs, as well as piece wise graphs. • Find approximate solutions to equations using graphs. 	<ul style="list-style-type: none"> • Factorise more complex quadratic expressions (of the form $ax^2 + bx + c$) (H) • Form and solve quadratic equations by factorising (of the form $ax^2 + bx + c$) (H) • Change the subject of a formula where the subject appears more than once (H). • Work with composite functions (H). • Work with inverse functions (H). • Identify the turning point of a quadratic function by completing the square (H). Work with composite functions (H). • Work with inverse functions (H). • Identify the turning point of a quadratic function by completing the square (H). 	<ul style="list-style-type: none"> • Enlarge and describe the enlargement of a shape by a negative scale factor, when a centre of enlargement is given (H). • Solve loci problems. • Recall how to use data to inform decisions and compare distributions. • Recall how to use cumulative frequency diagrams and box plots to compare distributions, as well as test a given hypothesis (H). 	



		<ul style="list-style-type: none"> • Recall how to calculate and use scale factors relating to the area and volume of similar shapes (H). • Understand when and how to use the proportionality symbol (\propto), as well as the constant of proportionality (k) (H). • Construct and use direct proportion equations (H). • Recall how to explore vector journeys in shapes (H). • Review the circle theorems covered previously (angles at the centre and circumference; angles in a semicircle; angles in the same segment; angles in a cyclic quadrilateral) (H). • Recall how to apply Pythagoras' theorem and/or trigonometry to problems. • Find the rule for the n^{th} term of a quadratic sequence (H). • Apply rules for sequences in order to solve problems (linear and quadratic). 		
<p>Complex Knowledge</p>	<ul style="list-style-type: none"> • Understand and use fractional indices (H). • Solve equations involving algebraic fractions (H). • Formulate algebraic arguments and proof. • Recognise when straight lines are perpendicular (H). • Find the equations of perpendicular lines, as well as the perpendicular bisector of a given line segment (H). • Find and use the equation of a circle, centre (0,0) (H). • Find the equation of the tangent to any curve (H). • Estimate the area under a curve (H). 	<ul style="list-style-type: none"> • Complete the square (H) • Solve quadratic equations using the quadratic formula (H). • Solve equations by iteration (H). • Solve quadratic inequalities (H). • Construct and use inverse proportion equations (H). • Understand and apply the remaining circle theorems (angle between radius and chord; angle between radius and tangent; two tangents from a point; alternate segment theorem) (H). • Solve a pair of simultaneous equations (one linear, one quadratic) using graphs, or algebraically (H). • Solve a pair of simultaneous equations involving a third unknown (H). • Solve inequalities in two variables using a graphical approach (H). • Construct formal algebraic proofs (H). 	<ul style="list-style-type: none"> • Identify invariant points and lines (H). • Understand and use trigonometric graphs (H). • Sketch and identify translations and reflections of the graph of a given function (H). • Recall how to use probability trees, including without replacement style problems (H). • Use the product rule formally for counting (H). 	
<p>Links with the National Curriculum</p>	<ul style="list-style-type: none"> • Developing fluency, reasoning and problem solving are embedded throughout the SoL, rather than treated separately. <p>STRAND(S): Number (Understand and Represent; Calculations); Algebra (Understand Notation and Substitution; Equivalence and Proof; Linear Graphs; Non-Linear Graphs); Ratio, Proportion, Rates of Change (Ratio and Rates).</p>	<ul style="list-style-type: none"> • Developing fluency, reasoning and problem solving are embedded throughout the SoL, rather than treated separately. <p>STRAND(S): Number (Calculations; Understand Fractions and Decimals); Algebra (Understand Notation and Substitution; Equivalence and Proof; Solve Equations and Inequalities; Sequences); Ratio, Proportion, Rates of Change (Multiplicative Relationships; Ratio and Rates); Geometry and Measures (Perimeter, Area and Volume; Shape Properties; Angles; Pythagoras and Trigonometry; Geometric Proof).</p>	<ul style="list-style-type: none"> • Developing fluency, reasoning and problem solving are embedded throughout the SoL, rather than treated separately. <p>STRAND(S): Number (Understand and Represent; Understand Fractions and Decimals; Percentages); Algebra (Non-Linear Graphs); Geometry and Measures (Construct and Transform Geometric Figures; Pythagoras and Trigonometry; Geometric</p>	



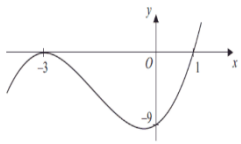
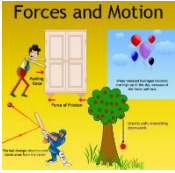
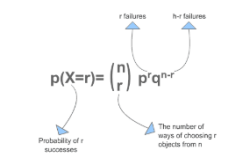
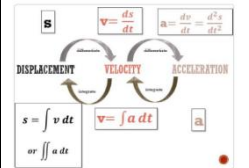
			Proof); Probability; Statistics (Represent and Interpret Data; Statistical Measures).	
Literacy (including reading)	<ul style="list-style-type: none"> • Key terminology outlined throughout as part of Quality First Teaching (QFT). • Students are routinely exposed to examination questions and taught how to interpret worded questions in particular. • Command words are regularly discussed to support students with preparation for examinations. 	<ul style="list-style-type: none"> • Key terminology outlined throughout as part of Quality First Teaching (QFT). • Students are routinely exposed to examination questions and taught how to interpret worded questions in particular. • Command words are regularly discussed to support students with preparation for examinations. • * Use of financial contexts is embedded through the percentages work, helping students to maintain familiarity with the vocabulary they are likely to hear outside of school. 	<ul style="list-style-type: none"> • Command words are regularly discussed to support students with preparation for examinations. 	
Cultural Capital		<ul style="list-style-type: none"> • Discussions about the origins of the trigonometric ratios and the historical developments around this. • Awareness of bearings and their use in aviation and navigation. • *Use of financial contexts is embedded through the percentages work (see above). 	<ul style="list-style-type: none"> • Recognise the beauty in pattern making and symmetrical patterns, as well as transformed images. 	
Social, Moral, Spiritual and Cultural Development	<ul style="list-style-type: none"> • In classrooms MWBs are used to help promote self-esteem and build self-confidence. • Paired discussions are integrated into lessons on a regular basis and students have the opportunity to work collaboratively and recognise that different learners can have different viewpoints/approaches. • Within lessons, respect is encouraged and anything other than this is challenged. Mistakes are welcomed and used as discussion points to address misconceptions. • A variety of approaches to solving problems are taught and discussed. Students are encouraged to develop strategies that work for them (linked to developing lifelong learners). • Students are given a choice of tasks in lessons (e.g. RAG, or Bronze, Silver, Gold), often linked to the Levels of Knowledge. • E-safety is promoted through the blended learning opportunities (Google Classroom). 			
Fundamental British Values				
Assessment	<ul style="list-style-type: none"> • END OF TOPIC BLOCK MINI-ASSESSMENTS (LOW STAKES): 1. Indices and roots 2. Manipulating expressions 3. Gradients and lines 4. Non-linear graphs 5. Using graphs <p>SUMMARY ASSESSMENT (November) – Calculator x1 (Tiered) and Non-Calculator x1 (Tiered). Created papers based on Yr10 content, plus Yr11 content up to and including ‘Gradients and Lines’ topic block.</p>	<ul style="list-style-type: none"> • END OF TOPIC BLOCK MINI-ASSESSMENTS (LOW STAKES): 1. Expanding and factorising 2. Changing the subject 3. Functions 4. Multiplicative reasoning 5. Geometric reasoning 6. Algebraic reasoning <p>SUMMARY ASSESSMENT (March) – Calculator x2 (Tiered) and Non-Calculator x1 (Tiered). Full set of papers for mock examinations (entire specification).</p>	<ul style="list-style-type: none"> • END OF TOPIC BLOCK MINI-ASSESSMENTS (LOW STAKES): 1. Transforming and constructing 2. Listing and describing 3. ‘Show that...’ <p>EXTERNAL GSCE EXAMINATIONS (MAY/JUNE).</p>	



Key Stage 5 Curriculum Journey: YEAR 12 Further Mathematics

The curriculum for Further Mathematics in Year 12 will enable students to understand mathematics and mathematical processes in a way that promotes their confidence, fosters enjoyment, and provides a strong foundation for progress to further study. Furthermore, it should push our most able mathematicians to explore, question and apply their range of mathematical skills and techniques, enabling them to understand how different areas of mathematics are connected. The curriculum will also enable students to use their mathematical knowledge to make logical and reasoned decisions in solving problems both within pure mathematics and in a variety of contexts. They will have the opportunity to investigate mathematics and logical thought beyond the examination specification through super curricular experiences including recreational mathematics and competitions.

THE YEAR 12 FURTHER MATHEMATICS CURRICULUM JOURNEY

	HALF TERM 1	HALF TERM 2	HALF TERM 3	HALF TERM 4	HALF TERM 5	HALF TERM 6																																
Topic and learning focus		<p>Reciprocal Identities</p> $\csc \theta = \frac{1}{\sin \theta}$ $\sec \theta = \frac{1}{\cos \theta}$ $\cot \theta = \frac{1}{\tan \theta}$ <p>Pythagorean Identities</p> $\sin^2 \theta + \cos^2 \theta = 1$ $\sec^2 \theta = 1 + \tan^2 \theta$ $\csc^2 \theta = 1 + \cot^2 \theta$			<table border="1"> <tr> <th colspan="2">Differentiation:</th> <th colspan="2">Integration:</th> </tr> <tr> <td>$y = f(x)$</td> <td>$\frac{dy}{dx} = f'(x)$</td> <td>$f(x)$</td> <td>$\int f(x) dx$</td> </tr> <tr> <td>x^n</td> <td>nx^{n-1}</td> <td>x^n</td> <td>$\frac{x^{n+1}}{n+1}$ $n \neq -1$</td> </tr> <tr> <td>e^x</td> <td>e^x</td> <td>e^x</td> <td>e^x</td> </tr> <tr> <td>$\ln x$</td> <td>$\frac{1}{x}$</td> <td>$\frac{1}{x}$</td> <td>$\ln x$</td> </tr> <tr> <td>$\sin x$</td> <td>$\cos x$</td> <td>$\cos x$</td> <td>$\sin x$</td> </tr> <tr> <td>$\cos x$</td> <td>$-\sin x$</td> <td>$-\sin x$</td> <td>$-\cos x$</td> </tr> <tr> <td>$\tan x$</td> <td>$\sec^2 x$</td> <td>$\sec^2 x$</td> <td>$\tan x$</td> </tr> </table>	Differentiation:		Integration:		$y = f(x)$	$\frac{dy}{dx} = f'(x)$	$f(x)$	$\int f(x) dx$	x^n	nx^{n-1}	x^n	$\frac{x^{n+1}}{n+1}$ $n \neq -1$	e^x	e^x	e^x	e^x	$\ln x$	$\frac{1}{x}$	$\frac{1}{x}$	$\ln x$	$\sin x$	$\cos x$	$\cos x$	$\sin x$	$\cos x$	$-\sin x$	$-\sin x$	$-\cos x$	$\tan x$	$\sec^2 x$	$\sec^2 x$	$\tan x$	
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	<p>Pure</p> <p>P1.2 – Quadratics P1.3 - Equations and Inequalities P1.4 - Graphs and Transformations P1.5 - Straight line graphs P1.6 – Circles P2.2 – Functions and Graphs P1.1 - Algebraic Expressions P1.7 - Algebraic methods P2.1 - Algebraic methods P1.8 - The binomial expansion P2.4 - Binomial expansion P1.12 - Differentiation P1.13 – Integration</p>	<p>Pure</p> <p>P1.9 - Trigonometric ratios P1.10 - Trigonometric identities P2.5 - Radians P2.6 - Trigonometric functions P2.7 - Trigonometric modelling</p> <p>Pure</p> <p>P1.11 - Vectors P2.12 - Vectors</p> <p>Statistics</p> <p>SM1.5 - Probability SM1.6 - Statistical distributions SM1.1 - Data collection SM1.2 - Measures of location and spread SM1.3 - Representations of data SM1.4 - Correlation</p>	<p>Pure</p> <p>P1.14 - Exponentials and logarithms</p> <p>Mechanics</p> <p>SM1.8 - Modelling in mechanics SM1.9 - Constant acceleration SM1.10 - Forces and motion</p> <p>Statistics</p> <p>SM1.7 - Hypothesis testing</p> <p>Pure</p> <p>P2.8 - Parametric equations P2.9 - Differentiation</p>	<p>Mechanics</p> <p>SM2.5 - Forces and friction SM1.11 - Variable acceleration SM2.4 - Moments SM2.7 - Application of forces</p> <p>Pure</p> <p>P2.9 – Differentiation (CONT) P2.11 – Integration</p>	<p>Mechanics</p> <p>SM2.6 – Projectiles SM2.8 - Further kinematics</p> <p>Pure</p> <p>P2.3 – Sequences/Series P2.10 - Numerical methods</p> <p>Pure</p> <p>P2.11 – Integration (CONT)</p> <p>Statistics</p> <p>SM2.2 - Conditional probability SM2.3 - The normal distribution SM2.1 - Regression, correlation and hypothesis testing</p> <p>Core Pure 1</p> <p>CP1.1 - Complex Numbers</p>	<p>Decision</p> <p>D1 – Algorithms D2 – Graphs and Networks</p> <p>Core Pure 1</p> <p>CP1.2 – Argand Diagrams CP1.3 – Series CP1.4 – Roots of Polynomials CP1.5 – Volumes of Revolution</p>																																
Foundational Knowledge Prior learning needed	<p>P1.1</p> <ul style="list-style-type: none"> Expand and factorise a single bracket. Understand basic rules of indices including simplifying positive and negative powers of the same base. 	<p>P1.9</p> <ul style="list-style-type: none"> Know and apply basic trig ratios to find missing sides and angles in a right-angle triangle. <p>P1.11</p>	<p>SM1.8</p> <ul style="list-style-type: none"> Solve quadratic equations. 	<p>SM1.11</p> <ul style="list-style-type: none"> Differentiate and integrate expressions. 	<p>P2.3</p> <ul style="list-style-type: none"> Know that in an arithmetic sequence the difference between consecutive terms is 	<p>D1</p> <ul style="list-style-type: none"> Understand how to construct and use a diagram of a function machine. 																																



	<ul style="list-style-type: none"> Understand that a surd is an irrational number that cannot be written as a fraction and that the 'surd form' is exact. P1.4 Understand and recall the basic shape of a linear and a quadratic graph including what is meant by the gradient, y-intercept and how these apply to the shape of these graphs. P1.2 Know that a quadratic is an algebraic expression where the highest power is 2. P1.3 Solve one and two step equations. Understand the term inequality and be able to solve simple linear inequalities algebraically. Represent an inequality on a number line. P1.5 Calculate the gradient of a straight line drawn on a graph. Identify the y-intercept. Write the equation of a straight line from given information or a sketch. Plot co-ordinate points. Calculate tables of values using algebraic equations. P1.6 Find the mid-point of a line segment. Know the key parts of a circle. Know and apply Pythagoras theorem. P1.7 Cancel factors in algebraic fractions. Factorise a quadratic expression. P2.1 Know how to add, subtract, multiply, and divide two or more fractions. P2.2 Sketch graphs of commonly used functions, including: $y = e^x$, $y = \ln x$, $y = x^3$ and trig graphs. Including any asymptotes or intercepts of axes. 	<ul style="list-style-type: none"> Understand what is meant by a vector Calculate the magnitude and direction of a vector. Use a column vector to describe a translation of a shape. Add and subtract column vectors. Use 'i and j' notation to describe vectors. P2.5 Know and recognise the graphs of Sin, Cos and Tan. Recall and use the values of commonly used angles. SM1.1 Recall and explain the key terms in data collection, including the different sampling methods. SM1.2 Calculate measures of location and spread. SM1.3 Recognise and identify outliers. SM1.4 Describe the nature of linear relationship between two variables in terms of correlation. SM1.5 Have a basic understanding of how to calculate simple probabilities, and how Venn and tree diagrams can be used to represent simple scenarios. SM1.6 Understand what a probability distribution is and know how to represent these using basic principles. 	<ul style="list-style-type: none"> Calculate sides and angles in right angle triangles. Convert basic units of length, time, speed. Use standard form. Find the gradient of a line. Calculate the area under a graph. Solve a pair of simultaneous equations. Use the quadratic formula. P1.14 Understand and use basic rules of indices. SM1.7 Be familiar with prior learning on the binomial distribution. P2.8 Sketch curves by plotting points. P2.9 Have a sound understanding of basic differentiation of polynomials. 	<ul style="list-style-type: none"> Calculate coordinates of turning points of a curve. Calculate the area under a curve using a definite integral. P2.9 Have a sound understanding of basic differentiation of polynomials. SM2.4 Calculate the moment created by a single force. SM2.5 Newton's Second Law - $F = ma$. Understand that a resultant force will produce an acceleration in that direction. Understand that when an object is in equilibrium the resultant force is zero. P2.11 Have a sound understanding of basic integration of polynomials. To have strong algebraic manipulation skills. SM2.7 Understand that a resultant force causes an acceleration, and that when there is no resultant force the object is in equilibrium. 	<p>constant, and also that the sum of this is known as an arithmetic series.</p> <ul style="list-style-type: none"> Know that in a geometric sequence consecutive terms have a constant ratio, and also that the sum of this is known as a geometric series. SM2.1 Apply the log rules to solve a range of statistical problems. SM2.2 Use set notation to describe events in a sample space. SM2.3 Perform calculations using the Binomial Distribution. P2.10 Identify the roots of a function from a sketch of the graph of that function. SM2.6 Understand the constant acceleration formulae. Understand friction. SM2.8 To know and understand the basic i-j vector notation. CP1.1 Use and manipulate surds. Rationalise a denominator. Solve quadratic equations by a range of methods, including completing the square. 	<p>CP1.2</p> <ul style="list-style-type: none"> Understand how to write an equation of a circle given a radius and centre. Use basic trig. Understand and apply understanding of complex numbers from previous chapter. CP1.3 Factorise quadratic expressions. Simplify an expression as a product of two factors. CP1.5 Recall and use methods of finding a definite integral. Calculate the area bounded by a curve and the x-axis. Calculate the area bound by a curve and a line.
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	<p>P2.4</p> <ul style="list-style-type: none"> Use the binomial expansion to expand basic expressions of the form: $(1 + x)^n$ 					
<p>Core Knowledge and skills</p>	<p>P1.1</p> <ul style="list-style-type: none"> Expand a double or triple bracket and factorise a simple quadratic polynomial, including those with coefficients of the squared term greater than 1. Simplify an algebraic fraction by cancelling common factors. Recognise and use the difference of two squares. Apply rules of indices that include fractional powers. To be able to manipulate surds using rules of multiplying or dividing surds, ie: $\sqrt{ab} = \sqrt{a} \times \sqrt{b}$, $\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$ <p>P1.4</p> <ul style="list-style-type: none"> Understand the basic shape of cubic and reciprocal graphs. Understand the relevance of the roots of a function to a graph of the function. Sketch a graph and label x-intercepts, y-intercepts and asymptotes. Transform a graph using rules for translation, enlargement and reflection. <p>P1.2</p> <ul style="list-style-type: none"> Find the solutions to a quadratic equation by factorising. Use the quadratic formula. Complete the square. Be aware of what a function is, how it relates to a mapping and be familiar with language such as domain and range. <p>P1.3</p> <ul style="list-style-type: none"> Solve linear simultaneous equations by elimination and substitution methods. Plot a linear graph on a set of cartesian axes. Use shading on a graph to represent the feasible region of a linear inequality. 	<p>P1.9</p> <ul style="list-style-type: none"> Know and apply the Sine and Cosine rules to calculate a missing side or angle in a triangle. Know and apply the formula for the area of a triangle using two sides and the included angle. Recognise and draw sketches of the graphs of sine, cosine and tangent. <p>P1.10</p> <ul style="list-style-type: none"> Be familiar and recall by memory or by first principles, the values of sine, cosine and tangent for 0, 30, 45, 60 and 90. Understand the symmetry, period and max/min values that exists within trigonometric graphs. <p>P1.11</p> <ul style="list-style-type: none"> Solve simple trigonometric equations. Understand that parallel vectors are scalar multiples of each other. Use vector notation and solve vector problems using vector geometry. Calculate a unit vector. Use a vector to describe a point in two dimensions. <p>P2.5</p> <ul style="list-style-type: none"> Convert between radians and degree and vice versa. Use formulae for arc length and sector area using radians Have a sound understanding of the graphs of basic trigonometric functions and basic transformations of curves – in degrees and radians. <p>P2.6</p> <ul style="list-style-type: none"> Be able apply this to solve basic trig equations and solve problems involving transformations of these functions. <p>P2.12</p>	<p>SM1.8</p> <ul style="list-style-type: none"> Draw a labelled diagram from the information given in a question. Understand and apply common assumptions used in mechanics. Know the difference between vector and scalar quantities. <p>SM1.9</p> <ul style="list-style-type: none"> Understand and interpret displacement-time and velocity-time graphs. Derive and use the constant acceleration (SUVAT) equations. <p>SM1.10</p> <ul style="list-style-type: none"> Draw a fully labelled force diagram. Understand and use Newton's second law. Calculate the resultant force be adding vectors. Find the magnitude of the resultant force and its direction. <p>P1.14</p> <ul style="list-style-type: none"> Plot graphs of the form $y = a^x$, $y = e^x$, and the transformations of these graphs. In addition, from their work on differentiation, students should know how to differentiate a function. Understand and apply rules of logarithms to solve simple equations 	<p>SM1.11</p> <ul style="list-style-type: none"> Understand and apply the relationship between displacement, velocity and acceleration. Use functions of time and algebraic substitution to find values for displacement, velocity and acceleration. Use calculus to find displacement, velocity and acceleration from other functions of time. <p>P2.9</p> <ul style="list-style-type: none"> Differentiate a function from first principles. Apply the 'rules' of differentiation to trig functions, exponentials and logs. Recognise when a problem requires the chain, product or quotient rule, and be able to apply them correctly. To be able to find second derivatives and link them with convex, concave and points of inflection. <p>SM2.5</p> <ul style="list-style-type: none"> Resolve forces confidently. Calculate the resultant moment on a rod, including both forces applied at 90 degrees to 	<p>P2.3</p> <ul style="list-style-type: none"> Use the formula $U_n = a + (n - 1)d$ to generate the nth term of an arithmetic sequence. Derive and use the formula for the sum of an arithmetic series. Write the sum of an arithmetic series in terms of the first and last terms. Use the formula $u_n = ar^{n-1}$ to generate the nth term of a geometric sequence. Derive and use the formula for the sum of a geometric series. <p>SM2.1</p> <ul style="list-style-type: none"> Solve regression problems using exponential models and logarithm rules. <p>SM2.2</p> <ul style="list-style-type: none"> Understand what conditional probability is and be able to apply this in simple calculations. <p>SM2.3</p> <ul style="list-style-type: none"> Understand the Normal distribution and the characteristics of the ND curve. Be confident in using the Normal Distribution mode on a calculator. Find the probabilities for normal cumulative distributions i.e.: 	<p>D1</p> <ul style="list-style-type: none"> Use and understand the term algorithm. Understand an algorithm given in words. Understand how flow charts can be used to describe an algorithm. Carry out a bubble sort. Carry out a quick sort. Carry out the three bin-packing algorithms. <p>D2</p> <ul style="list-style-type: none"> Be familiar with basic terminology used in graph theory. Know how graphs can be used to create mathematical models. Understand how graphs can be represented using matrices. Use the planarity algorithm to determine if a graph is planar. <p>CP1.2</p> <ul style="list-style-type: none"> Show complex numbers on an Argand diagram. Find the modulus and argument of a complex number. Write a complex number in modulus-argument form. <p>CP1.3</p> <ul style="list-style-type: none"> Use standard results for $\sum_{r=1}^n 1$ and $\sum_{r=1}^n r$ <p>CP1.4</p> <ul style="list-style-type: none"> Derive and use the relationship between



	<ul style="list-style-type: none"> • Use shading to represent the feasible region of a graph with two or more linear inequalities. P1.5 • Find the gradient and hence equation of a straight line from two coordinate points. P1.6 • Recall and understand the general form of the equation of a circle and use to find the centre of the circle and its radius. • Find the centre of a circle by completing the square. P1.7 • Divide a polynomial by a linear expression. • Understand the concept of the factor theorem and use to identify whether or not a binomial is a factor of a given expression. P1.8 • Use Pascal's triangle to identify binomial coefficients and use them to expand simple binomial expressions. • Be familiar with Binomial notation and use the binomial expansion to expand brackets. P1.12 • Understand that a gradient can be thought of as a rate of change and that the gradient of a curve at a given point is defined as the gradient of the tangent to the curve at that point. • Differentiate a simple expression to find the derivative using a rule. • Differentiate a quadratic. • Understand that differentiating can help you find the gradient of a curve. P2.1 • To know how to add, subtract, multiply, and divide two or more fractions. P2.2 • Know that $y = f(x)$ represents a modulus function. 	<ul style="list-style-type: none"> • Use column vectors and carry out arithmetic operations on vectors. • Calculate the magnitude and direction of a vector. • Understand and use position vectors. SM1.1 • Know what the large data set is. • Describe in basic terminology the different sampling methods and be able to comment on the advantages and disadvantages of these. • Interpret data from the large data set and draw appropriate conclusions. SM1.2 • Carry out complex calculations related to measures of location and spread. • Recognise and make basic calculations of variance and standard deviation. SM1.3 • Use appropriate calculations to identify outliers. • Draw and interpret box plots, cumulative frequency diagrams and histograms. SM1.4 • Determine if a correlation is due to a causal relationship. SM1.5 • Understand mutually exclusive and independent events and be able to identify these using Venn and tree diagrams. SM1.6 • Understand what a binomial distribution is and know the conditions required for this. 	<p>involving logarithms and/or unknown indices.</p> SM1.7 • Understand the language and concept of hypothesis testing (i.e., a null hypothesis and an alternative hypothesis). • Find critical values of a binomial distribution using appropriate calculations and tables. P2.8 • Draw parametric curves by plotting points. P2.9 • Differentiate a function from first principles. • Apply the 'rules' of differentiation to trig functions, exponentials and logs. • Recognise when a problem requires the chain, product or quotient rule, and be able to apply them correctly. • Find second derivatives and link them with convex, concave and points of inflection.	<p>the rod and at other angles.</p> <ul style="list-style-type: none"> • Solve problems where a rod is in equilibrium by resolving and taking moments. • Understand and use the formula for friction; $Fr = \mu R$. P2.11 • Integrate standard functions, by inspection. • Apply and use the trig identities and double angle formula from the first half term. SM2.7 • Resolve forces into their components. • Apply $F = \mu R$ and $F = ma$ to simple situations in answering questions on the application of forces. 	<p>percentage points on a normal curve.</p> <ul style="list-style-type: none"> • Find the inverse normal distribution i.e.: finding values on a normal curve. P2.10 • Locate the roots of a function by identifying a change of sign. SM2.6 • Apply the constant acceleration formulae separately to horizontal and vertical motion to solve simple problems. • Solve constant acceleration and projectile problems SM2.8 • Solve variable acceleration problems. CP1.1 • Understand and use the definitions of imaginary and complex numbers. • Add and subtract complex numbers. • Multiply complex numbers. 	<p>the roots of a quadratic equation.</p> CP1.5 • Find the volume of revolution when a curve is rotated around the x-axis.
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	<ul style="list-style-type: none"> • Sketch the graph of $y = ax + b$ • Understand that a mapping is a function if every input has a distinct output; and know that functions can be one-to-one or many-to-one • Understand and be able to apply the knowledge that $f(x + a)$ means a horizontal translation of $-a$ and $f(x) + a$ means a vertical translation of $+a$. • Understand and be able to apply the knowledge that $f(ax)$ means a horizontal stretch of scale factor $\frac{1}{a}$, $af(x)$ means a vertical stretch of scale factor a. • Know that $f(-x)$ reflects $f(x)$ in the y-axis and $-f(x)$ reflects $f(x)$ in the y-axis. <p>P2.4</p> <ul style="list-style-type: none"> • Use the binomial expansion to expand expressions of the form $(1 + x)^n$ where n can have a negative or fractional value. <p>P1.13</p> <ul style="list-style-type: none"> • Understand that integration is the reverse process of differentiation. • Integrate a simple expression to find the derivative using a rule. • Understand the term 'indefinite integral'. • Integrate a quadratic. • Understand that integrating can help you find the area under a curve. 					
<p>Developmental Knowledge and Skills</p>	<p>P1.1</p> <ul style="list-style-type: none"> • Apply the rules of surds above to rationalise a denominator. • Apply rules of indices in increasingly complex and explicit mathematical situations. <p>P1.4</p> <ul style="list-style-type: none"> • Apply understanding to quartic graphs and polynomials of higher order. • Use points of intersection of graphs to identify solutions to equations. 	<p>P1.9</p> <ul style="list-style-type: none"> • Be aware of the two possible solutions that can exist for solving questions using the sine rule. • Use and apply successive trig rules to solve more complex problems. • Transform trigonometric graphs. <p>P1.10</p> <ul style="list-style-type: none"> • Solve harder trigonometric equations. <p>P1.11</p>	<p>SM1.8</p> <ul style="list-style-type: none"> • Apply mathematical understanding to increasingly difficult mathematical models and worded multi-step problems. <p>SM1.9</p> <ul style="list-style-type: none"> • Use the constant acceleration equations to solve increasingly 	<p>SM1.11</p> <ul style="list-style-type: none"> • Use calculus to determine maximum and minimum values of displacement, velocity and acceleration. <p>P2.9</p> <ul style="list-style-type: none"> • Solve basic problems involving connected rates of change. • Differentiate a function given implicitly. 	<p>P2.3</p> <ul style="list-style-type: none"> • Understand that a geometric series only is convergent only if $r < 1$. • Know that the sum to infinity of a convergent geometric series is given by $S_{\infty} = \frac{a}{1-r}$ • Understand that the sigma notation (Σ) is 	<p>D1</p> <ul style="list-style-type: none"> • Understand the strengths and weaknesses of the three bin-packing algorithms. • Determine the order of an algorithm. <p>CP1.2</p> <ul style="list-style-type: none"> • Represent loci on an Argand diagram. • Represent regions on an Argand diagram.



	<ul style="list-style-type: none"> • Apply successive transformations to a graph. • Identify the location of points by applying understanding of how a transformation changes a graph. <p>P1.2</p> <ul style="list-style-type: none"> • Use the completed square format to solve a quadratic equation. • Apply a completed square to find the turning point of a quadratic graph. • Understand the term discriminant, be able to calculate it and use the answer to determine the nature of the roots of function. <p>P1.3</p> <ul style="list-style-type: none"> • Solve simultaneous equations involving a quadratic and a linear equation. • Use a graph to show and check solutions of a quadratic and a linear pair of simultaneous equations. • Identify solutions to a quadratic inequality by identifying critical values. <p>P1.5</p> <ul style="list-style-type: none"> • Identify parallel and perpendicular lines and understand the relevance of their associated gradient. • Calculate the length of a line segment. • Use straight lines to model a relationship between two variables. • Explain the relevance of a gradient or y-intercept of a straight line with reference to a modelled example. <p>P1.6</p> <ul style="list-style-type: none"> • Understand and find the perpendicular bisector of a line segment. • Use algebra to find the coordinates of points of intersection of straight lines and circles. • Recall, use and apply tangent and chord properties. <p>P1.7</p> <ul style="list-style-type: none"> • Use the factor theorem to factorise a cubic expression 	<ul style="list-style-type: none"> • Solve more complex geometric problems using vectors. <p>P2.5</p> <ul style="list-style-type: none"> • Solve complex questions involving radians. • Solve problems involving small angle approximations. <p>P2.6</p> <ul style="list-style-type: none"> • Apply transformations to the graphs of $\text{cosec}\theta$, $\text{sec}\theta$ and $\text{cot}\theta$. • Solve more difficult trig equations and proof problems involving $\text{cosec}\theta$, $\text{sec}\theta$ and $\text{cot}\theta$. • Derive the identities $\tan^2\theta + 1 = \text{sec}^2\theta$ and $1 + \cot^2\theta = \text{cosec}^2\theta$ and solve trig equations and proof problems involving them. <p>P2.7</p> <ul style="list-style-type: none"> • Solve simple problems involving addition formulae and double angle formulae. • Understand the inverse trig graphs of $y=\sin^{-1}x$, $y=\cos^{-1}x$ and $y=\tan^{-1}x$ <p>P2.12</p> <ul style="list-style-type: none"> • Use vectors to solve geometric problems. • Understand vector magnitude and use vectors in speed and distance calculations. <p>SM1.1</p> <ul style="list-style-type: none"> • Describe in detail the different sampling methods and be able to comment accurately on the advantages and disadvantages of each of these. • Make more detailed interpretations of the large data set and use this to perform appropriate calculations. <p>SM1.2</p> <ul style="list-style-type: none"> • Calculate measures of location and spread, and be able to identify the most appropriate measures based on the context of the data (reliability); this will also include the method of linear interpolation. 	<p>difficult multi-step problems.</p> <ul style="list-style-type: none"> • Understand how to model a question describing vertical motion under gravity. <p>SM1.10</p> <ul style="list-style-type: none"> • Use Newton's second law when solving problems in two dimensions. <p>P1.14</p> <ul style="list-style-type: none"> • Solve more difficult problems using exponentials and logarithms. • Differentiate e^{kx} • Work with the natural logarithm. <p>SM1.7</p> <ul style="list-style-type: none"> • Carry out appropriate calculations for one and two tailed tests of a binomial distribution. <p>P2.8</p> <ul style="list-style-type: none"> • Use algebraic skills and knowledge of the trig identities to convert between parametric and Cartesian equations. • Differentiate a function given in parametric form. <p>P2.9</p> <ul style="list-style-type: none"> • Solve basic problems involving connected rates of change. • Differentiate a function given implicitly. 	<p>SM2.4</p> <ul style="list-style-type: none"> • Find where the centre of mass for a non-uniform rod is. • Solve problems where rods are on the point of tilting. <p>SM2.5</p> <ul style="list-style-type: none"> • Understand the difference between static and dynamic problems and be able to solve these where you have to resolve forces into their components. • Understand what is meant by the term 'limiting equilibrium' and how this applies to a question. <p>P2.11</p> <ul style="list-style-type: none"> • Integrate functions by doing the reverse of the chain rule, so 'what would differentiate to give me....' • Identify when a function can be re-written using a trig identity to enable you to integrate it. • Integrate using a given substitution. • Apply the formula for integration by parts in standard questions. • Split a function into its partial fractions, and then integrate each part separately. • Use integration to find the area under a curve using all of the above integration methods. • Recognise when a function can't be 	<p>used to signify a sum, and limits are written on the top and bottom to show which terms you are summing.</p> <p>SM2.1</p> <ul style="list-style-type: none"> • Calculate the product moment correlation coefficient. • Use one-tailed hypothesis tests for zero correlation. <p>SM2.2</p> <ul style="list-style-type: none"> • Calculate conditional probabilities using Venn diagrams, probability formulae and tree diagrams. <p>SM2.3</p> <ul style="list-style-type: none"> • Understand the relevance of the Standard Normal Distribution and be able to find percentage points and values from this. • Use standard values and the standardising equation to code or decode non-standard values. • Find the mean or standard deviation for a normally distributed variable using the calculator. • Approximate a binomial distribution using the Normal Distribution. <p>P2.10</p> <ul style="list-style-type: none"> • Solve equations of the form $f(x) = 0$ by using an iterative approach, which can be in the 	<p>CP1.3</p> <ul style="list-style-type: none"> • Use standard results for $\sum_{r=1}^n r^2$ and $\sum_{r=1}^n r^3$ <p>CP1.4</p> <ul style="list-style-type: none"> • Derive and use the relationship between the roots of a cubic equation. • Derive and use the relationship between the roots of a quartic equation. • Evaluate expressions relating to the roots of polynomials. <p>CP1.5</p> <ul style="list-style-type: none"> • Find the volume of revolution when a curve is rotated around the y-axis. • Find more complicated volumes of revolution.
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	<ul style="list-style-type: none"> • Construct mathematical proofs using algebra – ‘deduction’ P1.8 • Find individual coefficients in a binomial expansion. P1.12 • Understand the term ‘normal’. • Use the derivative to determine if a function is increasing or decreasing in a given interval. • Understand the implications of the gradient being zero and how this can help us find the stationary points. • Find the second derivative and use to determine the nature of a stationary point. P2.1 • Find the partial fractions when there are more than two distinct linear factors in the denominator. • Know that a single fraction with a repeated linear factor in the denominator can be split into two or more separate fractions. P2.2 • Know that the functions $f(x)$ and $f^{-1}(x)$ are inverses of each other, and that $ff^{-1}(x)$ and $f^{-1}f(x) = x$ • The graphs of $f(x)$ and $f^{-1}(x)$ are reflections of each other in the line $y = x$. • To understand that the domain of $f(x)$ is the range of $f^{-1}(x)$ and the range of $f(x)$ is the domain of $f^{-1}(x)$. • Know how to sketch the graphs of $y = f(x)$ and $y = f x(x)$. • Combine transformations. P1.13 • Find a function given its derivative. • Understand the term ‘definite integral’ and use to find the area under a curve bounded by two values. 	<ul style="list-style-type: none"> • Calculate variance and standard deviation. SM1.3 • Draw and interpret box plots, cumulative frequency diagrams and histograms from more complex data; to include being able to compare data sets. SM1.4 • Link the relationship between 2 variables using a regression line and use this to describe how data is correlated. • Use a regression line to make predictions for values of the dependent variable that are within the range of the given data. SM1.5 • Perform more difficult probability calculations, as well as use Venn and tree diagrams to do the same. • Perform more complex probability calculations, including those for mutually exclusive and independent events. In addition, students will be able to use Venn and tree diagrams to do the same. SM1.6 • Perform calculations of the binomial distribution. 	<p>integrated to find an area under a curve, and be able to apply the trapezium rule to it.</p> <ul style="list-style-type: none"> • Separate out a first order differential equation, to integrate each variable separately. SM2.7 • Solve problems where particles are on rough inclined planes, either released from rest, or fired up a plane, or connected particles. • Solve problems that involve resolving and taking moments, such as ladder problems and rods resting on pegs. These problems may be on rough or smooth surfaces. 	<p>form of a ‘cobweb’ or ‘staircase’ diagram.</p> <ul style="list-style-type: none"> • Use the Newton-Raphson method to find numerical solutions to equations of the form $f(x) = 0$ SM2.6 • Solve problems where a projectile is fired at any speed at any angle and from any height. SM2.8 • Solve constant acceleration and projectile problems in terms of vectors. • Solve variable acceleration problems in terms of vectors. CP1.1 • Understand the definition of a complex conjugate. • Divide complex numbers. • Solve quadratic equations that have complex roots. 	
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<p>Complex Knowledge</p>	<p>P1.1</p> <ul style="list-style-type: none"> Apply understanding of algebraic expressions to implicit mathematical situations including a range of worded questions they relate to real-life contexts. <p>P1.2</p> <ul style="list-style-type: none"> Prove the quadratic formula by completing the square with a general form of a quadratic equation. Use and apply understanding of quadratics to a mathematical model or question in a real-life, implicitly mathematical context. <p>P1.3</p> <ul style="list-style-type: none"> Apply understanding of equations and inequalities to solve mathematical problems in a variety of contexts. <p>P1.7</p> <ul style="list-style-type: none"> Use proof by exhaustion and disproof by counter-example. Apply concepts of proof to unfamiliar but connected examples. <p>P1.8</p> <ul style="list-style-type: none"> Make approximations using the binomial expansion. <p>P1.12</p> <ul style="list-style-type: none"> Find the derivative of a simple function from first principles. Use differentiation to model and solve complex mathematical problems. <p>P2.1</p> <ul style="list-style-type: none"> Recognise and know how to convert an improper fraction to a mixed fraction before expressing it in partial fractions. <p>P2.2</p> <ul style="list-style-type: none"> Solve modulus problems using graphical as well as algebraic methods. <p>P2.4</p> <ul style="list-style-type: none"> Use partial fractions to simplify expansions of more difficult expressions. <p>P1.13</p> <ul style="list-style-type: none"> Use integration to find the area under the x-axis. 	<p>P1.9</p> <ul style="list-style-type: none"> Recall, use and apply geometric properties of triangles, quadrilaterals and circles, including circle theorems to solve more complex problems involving circles. <p>P1.10</p> <ul style="list-style-type: none"> Solve increasingly complex trigonometric equations including quadratics. <p>P1.11</p> <ul style="list-style-type: none"> Use vectors to model a mathematical situation based on a real-life context and solve the problem. <p>P1.12</p> <ul style="list-style-type: none"> Use vectors to solve problems in context. <p>P2.7</p> <ul style="list-style-type: none"> Simplify and use $a\cos x \pm b\sin x$ Solve more complex problems using all of the above trig functions and identities. Solve modelling problems using the above trig skills. <p>SM1.2</p> <ul style="list-style-type: none"> Use coding with grouped and discrete and grouped data. Describe how coding affects the data and measures of location and spread and use this understanding to decode the data or calculations made from it. Articulate how and why we might use coding and why it may be appropriate. <p>SM1.6</p> <ul style="list-style-type: none"> Understand what a cumulative probability function is and be able to use the tables in the formula booklet to calculate these. 	<p>SM1.9</p> <ul style="list-style-type: none"> Understand the principles that apply to connected particles and use this to solve questions. Understand the principles that apply to pulleys and use this to solve questions. <p>P1.14</p> <ul style="list-style-type: none"> Solve complex exponential and logarithm problems, including modelling-based problems. Use logarithms to manage and explore non-linear trends in data. <p>SM1.7</p> <ul style="list-style-type: none"> Carry out more complex calculations for one and two tailed tests of a binomial distribution. <p>P2.8</p> <ul style="list-style-type: none"> Solve more complicated problems where the functions are given in terms of parametric equations. <p>P2.9</p> <ul style="list-style-type: none"> Solve more complex problems using all the various differentiation skills including modelling problems using the differentiation skills. 	<p>SM1.11</p> <ul style="list-style-type: none"> Use calculus to derive the formulae for motion with constant particle acceleration. Use understanding of calculus to solve a range of complex multi-stage worded problems involving functions of time. <p>P2.9</p> <ul style="list-style-type: none"> Solve more complex problems using all the various differentiation skills including questions that involve modelling problems using the differentiation skills. <p>SM2.4</p> <ul style="list-style-type: none"> Solve more complicated/algebraic problems involving moments. <p>SM2.5</p> <ul style="list-style-type: none"> Solve more complex static and dynamic problems, where R is given in terms of an unknown force. <p>P2.11</p> <ul style="list-style-type: none"> Recognise which method of integration to use to solve a particular problem. 	<p>P2.3</p> <ul style="list-style-type: none"> Use recurrence relationships to describe the relationship from one term to the next. Identify increasing and decreasing sequences. Model with series. <p>SM2.1</p> <ul style="list-style-type: none"> Use two-tailed hypothesis tests for zero correlation. <p>SM2.2</p> <ul style="list-style-type: none"> Calculate more complex conditional probabilities using Venn diagrams, probability formulae and tree diagrams. <p>SM2.3</p> <ul style="list-style-type: none"> Know how to apply a continuity correction when calculating probabilities using a normal distribution to a binomial distribution. Perform hypothesis testing with the normal distribution. <p>P2.10</p> <ul style="list-style-type: none"> Apply numerical methods to find solutions to models of real-life situations. Derive and apply the general formula for a projectile. Solve more complex/algebraic problems involving particles on planes. <p>SM2.6</p> <ul style="list-style-type: none"> Solve complicated constant acceleration and projectile problems in vectors. 	<p>CP1.3</p> <ul style="list-style-type: none"> Evaluate and simplify series of the form $\sum_{r=m}^n f(r)$, where $f(r)$ is linear, quadratic or cubic. <p>CP1.4</p> <ul style="list-style-type: none"> Find the equation of a polynomial whose roots are a linear transformation of the roots of a given polynomial. <p>CP1.5</p> <ul style="list-style-type: none"> Model real-life objects using volumes of revolution.
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	<ul style="list-style-type: none"> Use integration to find the area between a curve and a line. 				<p>SM2.8</p> <ul style="list-style-type: none"> Solve more complex variable acceleration problems in terms of vectors. <p>CP1.1</p> <ul style="list-style-type: none"> Solve cubic or quartic equations that have complex roots. 	
<p>Links with the National Curriculum (Overarching Themes from the Specification)</p>	<ul style="list-style-type: none"> The overarching themes (a) mathematical argument, language and proof, b) mathematical problem solving, c) mathematical modelling) are applied throughout the programme of study and SoL. Links directly to Edexcel specification: Pure Mathematics 1. 	<ul style="list-style-type: none"> The overarching themes (a) mathematical argument, language and proof, b) mathematical problem solving, c) mathematical modelling) are applied throughout the programme of study and SoL. Links directly to Edexcel specification: Pure Mathematics 1 & 2, Statistics 1. 	<ul style="list-style-type: none"> The overarching themes (a) mathematical argument, language and proof, b) mathematical problem solving, c) mathematical modelling) are applied throughout the programme of study and SoL. Links directly to Edexcel specification: Pure Mathematics 1 & 2, Mechanics 1, Statistics 1. 	<ul style="list-style-type: none"> The overarching themes (a) mathematical argument, language and proof, b) mathematical problem solving, c) mathematical modelling) are applied throughout the programme of study and SoL. Links directly to Edexcel specification: Mechanics 1, Pure Mathematics 2. 	<ul style="list-style-type: none"> The overarching themes (a) mathematical argument, language and proof, b) mathematical problem solving, c) mathematical modelling) are applied throughout the programme of study and SoL. Links directly to Edexcel specification: Pure Mathematics 1 & 2, Statistics 2, Mechanics 1, Core Pure Mathematics 1. 	<ul style="list-style-type: none"> The overarching themes (a) mathematical argument, language and proof, b) mathematical problem solving, c) mathematical modelling) are applied throughout the programme of study and SoL. Links directly to Edexcel specification: Core Pure Mathematics 1, Decision 1.
<p>Literacy (including reading)</p>	<ul style="list-style-type: none"> Key terminology outlined throughout as part of Quality First Teaching (QFT). 	<ul style="list-style-type: none"> Key terminology outlined throughout as part of Quality First Teaching (QFT). 	<ul style="list-style-type: none"> Key terminology outlined throughout as part of Quality First Teaching (QFT). 	<ul style="list-style-type: none"> Key terminology outlined throughout as part of Quality First Teaching (QFT). 	<ul style="list-style-type: none"> Key terminology outlined throughout as part of Quality First Teaching (QFT). 	<ul style="list-style-type: none"> Key terminology outlined throughout as part of Quality First Teaching (QFT).
<p>Cultural Capital</p>	<ul style="list-style-type: none"> Construct rigorous mathematical arguments, make deductions and inferences, assess the validity of mathematical arguments, explain their reasoning and use mathematical language and notation correctly in a wider context. 	<ul style="list-style-type: none"> Discussions about the origins of the trigonometric ratios and the historical developments around this. Interpret and use a variety of statistical representations and consider the limitations these are can have for portraying accurate data. 	<ul style="list-style-type: none"> Interpret and use a variety of statistical representations and consider the limitations these are can have for portraying accurate data. 	<ul style="list-style-type: none"> Translate situations in context into mathematical models & use mathematical models. 	<ul style="list-style-type: none"> Interpret and use a variety of statistical representations and consider the limitations these are can have for portraying accurate data. Translate situations in context into mathematical models & use mathematical models Evaluate the outcomes of modelling in context, 	<ul style="list-style-type: none"> Evaluate the outcomes of modelling in context, recognise the limitations of models and, where appropriate, explain how to refine them.



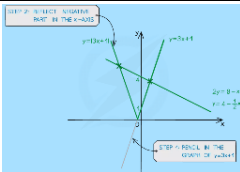
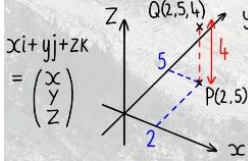
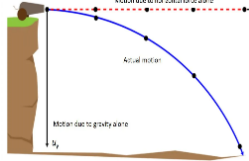

						recognise the limitations of models and, where appropriate, explain how to refine them	
Social, Moral, Spiritual and Cultural Development	<ul style="list-style-type: none"> • In classrooms MWBs are used to help promote self-esteem and build self-confidence. • Paired/small group discussions are integrated into lessons on a regular basis and students have the opportunity to work collaboratively and recognise that different learners can have different viewpoints/approaches. • Within lessons, respect is encouraged and anything other than this is challenged. Mistakes are welcomed and used as discussion points to address misconceptions. • A variety of approaches to solving problems are taught and discussed. Students are encouraged to develop strategies that work for them (linked to developing lifelong learners). • E-safety is promoted through the blended learning opportunities (Google Classroom) and regular use of other online resources. 						
Fundamental British Values							
Assessment	<p>Transition Assessment (September) – pre-requisite work set as transition work.</p> <p>(To be started in Sept 2022): Formative Homework tasks & class based end of chapter mini- assessments.</p>	<p>Formative Homework tasks & class based end of chapter mini-assessments.</p> <p>Summative Assessment 1: Pure content (P1.1-P1.8, P1.12, P1.13, P2.1, P2.2, P2.4).</p>	<p>Formative Homework tasks & class based end of chapter mini-assessments.</p> <p>Summative Assessment 2: Pure content (P1.1-P1.14, P2.1-P2.8, P2.12). Statistics content (SM1.1-1.7). Mechanics content (SM1.8-SM1.10).</p>	<p>Formative Homework tasks & class based end of chapter mini-assessments.</p>	<p>Formative Homework tasks & class based end of chapter mini-assessments.</p>	<p>Formative Homework tasks & class based end of chapter mini-assessments.</p> <p>End of Year Exams Exam papers assessing all half term 1-5 content (at the start of the half term 6). Full A Level Mathematics papers used as specification content covered.</p>	



Key Stage 5 Curriculum Journey: YEAR 13

The curriculum in Year 13 will enable students to understand mathematics and mathematical processes in a way that promotes their confidence, fosters enjoyment, and provides a strong foundation for progress to further study. It will build on the Year 12 curriculum and extend their range of mathematical skills and techniques, improve their understanding of the coherence and progression in mathematics and how different areas of mathematics are connected. Students will be able to apply mathematics in other fields of study and be aware of the relevance of mathematics to the world of work and to situations in society in general. Students will be able to use their mathematical knowledge to make logical and reasoned decisions in solving problems both within pure mathematics and in a variety of contexts; and communicate the mathematical rationale for these decisions clearly.

THE YEAR 13 CURRICULUM JOURNEY

	HALF TERM 1	HALF TERM 2	HALF TERM 3	HALF TERM 4	HALF TERM 5/6																							
Topic and learning focus	<table border="1"> <thead> <tr> <th></th> <th>0°</th> <th>30°</th> <th>45°</th> <th>60°</th> <th>90°</th> </tr> </thead> <tbody> <tr> <td>SIN</td> <td>0</td> <td>$\frac{1}{2}$</td> <td>$\frac{1}{\sqrt{2}}$</td> <td>$\frac{\sqrt{3}}{2}$</td> <td>1</td> </tr> <tr> <td>COS</td> <td>1</td> <td>$\frac{\sqrt{3}}{2}$</td> <td>$\frac{1}{\sqrt{2}}$</td> <td>$\frac{1}{2}$</td> <td>0</td> </tr> <tr> <td>TAN</td> <td>0</td> <td>$\frac{1}{\sqrt{3}}$</td> <td>1</td> <td>$\sqrt{3}$</td> <td>∞</td> </tr> </tbody> </table> 		0°	30°	45°	60°	90°	SIN	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1	COS	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0	TAN	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	∞			
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TAN	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	∞																							
	<p>Pure P2.3 - Sequences and series P2.1 - Algebraic methods P2.5 - Radians P2.6 - Trigonometric functions P2.7 - Trigonometric modelling P2.8 - Parametric equations</p>	<p>Pure P2.2 - Functions and graphs P2.4 - Binomial expansion Statistics SM2.1 - Regression, correlation and hypothesis testing SM2.2 - Conditional probability Pure P2.9 - Differentiation Mechanics SM2.4 - Moments SM2.5 - Forces and friction</p>	<p>Statistics SM2.2 - Conditional probability (CONT) SM2.3 - The normal distribution Pure P2.11 - Integration P2.12 - Vectors</p>	<p>Statistics SM2.3 - The normal distribution (CONT) Pure P2.10 - Numerical methods Mechanics SM2.6 - Projectiles SM2.7 - Application of forces SM2.8 - Further kinematics</p>	<p>Revision and review/preparations for exams.</p>																							
Foundational Knowledge Prior learning needed	<p>P2.3</p> <ul style="list-style-type: none"> Know that in an arithmetic sequence the difference between consecutive terms is constant, and also that the sum of this is known as an arithmetic series. Know that in a geometric sequence consecutive terms have a constant ratio, and also that the sum of this is known as a geometric series. <p>P2.1</p> <ul style="list-style-type: none"> Know how to add, subtract, multiply, and divide two or more fractions. <p>P2.5</p>	<p>P2.2</p> <ul style="list-style-type: none"> Sketch graphs of commonly used functions, including: $y = e^x$, $y = \ln x$, $y = x^3$ and trig graphs. Including any asymptotes or intercepts of axes. <p>P2.4</p> <ul style="list-style-type: none"> Use the binomial expansion to expand basic expressions of the form: $(1 + x)^n$ <p>SM2.1</p> <ul style="list-style-type: none"> Apply the log rules to solve a range of statistical problems. <p>SM2.2</p> <ul style="list-style-type: none"> Use set notation to describe events in a sample space. 	<p>SM2.3</p> <ul style="list-style-type: none"> Perform calculations using the Binomial Distribution. <p>P2.12</p> <ul style="list-style-type: none"> To have a basic understanding of vectors in 2D. <p>P2.11</p> <ul style="list-style-type: none"> Have a sound understanding of basic integration of polynomials. To have strong algebraic manipulation skills. 	<p>P2.10</p> <ul style="list-style-type: none"> Identify the roots of a function from a sketch of the graph of that function. <p>SM2.6</p> <ul style="list-style-type: none"> To have a sound understanding of the constant acceleration formulae. Have a good understanding of friction. <p>SM2.7</p> <ul style="list-style-type: none"> Understand that a resultant force causes an acceleration, and that when there is no 																								



	<ul style="list-style-type: none"> • Know and recognise the graphs of Sin, Cos and Tan. • Recall and use the values of commonly used angles. <p>P2.8</p> <ul style="list-style-type: none"> • Sketch curves by plotting points. 	<p>P2.9</p> <ul style="list-style-type: none"> • Have a sound understanding of basic differentiation of polynomials. <p>SM2.4</p> <ul style="list-style-type: none"> • Calculate the moment created by a single force. <p>SM2.5</p> <ul style="list-style-type: none"> • Newton's Second Law - $F = ma$. Understand that a resultant force will produce an acceleration in that direction. • Understand that when an object is in equilibrium the resultant force is zero. 		<p>resultant force the object is in equilibrium.</p> <p>SM2.8</p> <ul style="list-style-type: none"> • Know and understand the basic i-j vector notation. 	
<p>Core Knowledge and skills</p>	<p>P2.3</p> <ul style="list-style-type: none"> • Use the formula $U_n = a + (n - 1)d$ to generate the nth term of an arithmetic sequence. • Derive and use the formula for the sum of an arithmetic series. • Write the sum of an arithmetic series in terms of the first and last terms. • Use the formula $u_n = ar^{n-1}$ to generate the nth term of a geometric sequence. • Derive and use the formula for the sum of a geometric series. <p>P2.1</p> <ul style="list-style-type: none"> • Apply the correct processes for proof by contradiction. • Split a single fraction with two distinct linear factors in the denominator into two separate fractions with linear denominators and know that these are called partial fractions. <p>P2.5</p> <ul style="list-style-type: none"> • Convert between radians and degree and vice versa. • Use formulae for arc length and sector area using radians • Have a sound understanding of the graphs of basic trigonometric functions and basic transformations of curves – in degrees and radians. <p>P2.6</p> <ul style="list-style-type: none"> • Solve basic trig equations and solve problems involving transformations of these functions. <p>P2.8</p>	<p>P2.2</p> <ul style="list-style-type: none"> • Know that $y = f(x)$ represents a modulus function. • Sketch the graph of $y = ax + b$ • Understand that a mapping is a function if every input has a distinct output; and know that functions can be one-to-one or many-to-one • Understand and be able to apply the knowledge that $f(x + a)$ means a horizontal translation of $-a$ and $f(x) + a$ means a vertical translation of $+a$. • Understand and be able to apply the knowledge that $f(ax)$ means a horizontal stretch of scale factor $\frac{1}{a}$, $af(x)$ means a vertical stretch of scale factor a. • Know that $f(-x)$ reflects $f(x)$ in the y-axis and $-f(x)$ reflects $f(x)$ in the y-axis. <p>P2.4</p> <ul style="list-style-type: none"> • Use the binomial expansion to expand expressions of the form $(1 + x)^n$ where n can have a negative or fractional value. <p>SM2.1</p> <ul style="list-style-type: none"> • Solve regression problems using exponential models and logarithm rules. <p>SM2.2</p> <ul style="list-style-type: none"> • Understand what conditional probability is and be able to apply this in simple calculations. <p>P2.9</p> <ul style="list-style-type: none"> • Differentiate a function from first principles. • Apply the 'rules' of differentiation to trig functions, exponentials and logs. 	<p>SM2.3</p> <ul style="list-style-type: none"> • Understand the Normal distribution and the characteristics of the ND curve. • Be confident in using the Normal Distribution mode on a calculator. • Find the probabilities for normal cumulative distributions i.e.: percentage points on a normal curve. • Find the inverse normal distribution i.e.: finding values on a normal curve. <p>P2.12</p> <ul style="list-style-type: none"> • Use column vectors and carry out arithmetic operations on vectors. • Calculate the magnitude and direction of a vector. • Understand and use position vectors. <p>P2.11</p> <ul style="list-style-type: none"> • Integrate standard functions, by inspection. • To be confident using the trig identities and double angle formula from the first half term. 	<p>P2.10</p> <ul style="list-style-type: none"> • Locate the roots of a function by identifying a change of sign. <p>SM2.6</p> <ul style="list-style-type: none"> • Apply the constant acceleration formulae separately to horizontal and vertical motion to solve simple problems. • Solve constant acceleration and projectile problems. <p>SM2.7</p> <ul style="list-style-type: none"> • Resolve forces into their components. • Apply $F = \mu R$ and $F = ma$ to simple situations in answering questions on the application of forces. <p>SM2.8</p> <ul style="list-style-type: none"> • Solve variable acceleration problems. 	



	<ul style="list-style-type: none"> • Draw parametric curves by plotting points. 	<ul style="list-style-type: none"> • Recognise when a problem requires the chain, product or quotient rule, and be able to apply them correctly. • Find second derivatives and link them with convex, concave and points of inflection. <p>SM2.5</p> <ul style="list-style-type: none"> • Resolve forces confidently. • Calculate the resultant moment on a rod, including both forces applied at 90 degrees to the rod and at other angles. • Solve problems where a rod is in equilibrium by resolving and taking moments. • Understand and use the formula for friction; $Fr = \mu R$. 			
<p>Developmental Knowledge and Skills</p>	<p>P2.3</p> <ul style="list-style-type: none"> • Understand that a geometric series only is convergent only if $r < 1$. • Know that the sum to infinity of a convergent geometric series is given by $S_{\infty} = \frac{a}{1-r}$ • Understand that the sigma notation (Σ) is used to signify a sum, and limits are written on the top and bottom to show which terms you are summing. <p>P2.1</p> <ul style="list-style-type: none"> • Find the partial fractions when there are more than two distinct linear factors in the denominator. • Know that a single fraction with a repeated linear factor in the denominator can be split into two or more separate fractions. <p>P2.5</p> <ul style="list-style-type: none"> • Solve complex questions involving radians. • Solve problems involving small angle approximations. <p>P2.6</p> <ul style="list-style-type: none"> • Apply transformations to the graphs of $\text{cosec}\theta$, $\text{sec}\theta$ and $\text{cot}\theta$. • Solve more difficult trig equations and proof problems involving $\text{cosec}\theta$, $\text{sec}\theta$ and $\text{cot}\theta$. 	<p>P2.2</p> <ul style="list-style-type: none"> • Know that the functions $f(x)$ and $f^{-1}(x)$ are inverses of each other, and that $ff^{-1}(x)$ and $f^{-1}f(x) = x$ • Know that the graphs of $f(x)$ and $f^{-1}(x)$ are reflections of each other in the line $y = x$. • Understand that the domain of $f(x)$ is the range of $f^{-1}(x)$ and the range of $f(x)$ is the domain of $f^{-1}(x)$. • Know how to sketch the graphs of $y = f(x)$ and $y = f (x)$. • Combine transformations. <p>SM2.1</p> <ul style="list-style-type: none"> • Calculate the product moment correlation coefficient. • Use one-tailed hypothesis tests for zero correlation. <p>SM2.2</p> <ul style="list-style-type: none"> • Calculate conditional probabilities using Venn diagrams, probability formulae and tree diagrams. <p>P2.9</p> <ul style="list-style-type: none"> • Solve basic problems involving connected rates of change. • Differentiate a function given implicitly. <p>SM2.4</p> <ul style="list-style-type: none"> • Find where the centre of mass for a non-uniform rod is. • Solve problems where rods are on the point of tilting. <p>SM2.5</p>	<p>SM2.3</p> <ul style="list-style-type: none"> • Understand the relevance of the Standard Normal Distribution and be able to find percentage points and values from this. • Use standard values and the standardising equation to code or de-code non-standard values. • Find the mean or standard deviation for a normally distributed variable using the calculator. • Approximate a binomial distribution using the Normal Distribution. <p>P2.12</p> <ul style="list-style-type: none"> • Use vectors to solve geometric problems. • Understand vector magnitude and use vectors in speed and distance calculations. <p>P2.11</p> <ul style="list-style-type: none"> • Integrate functions by doing the reverse of the chain rule, so 'what would differentiate to give me....' • Identify when a function can be re-written using a trig identity to enable you to integrate it. • To be able to do an integration using a given substitution. 	<p>P2.10</p> <ul style="list-style-type: none"> • Solve equations of the form $f(x) = 0$ by using an iterative approach, which can be in the form of a 'cobweb' or 'staircase' diagram. • Use the Newton-Raphson method to find numerical solutions to equations of the form $f(x) = 0$ <p>SM2.6</p> <ul style="list-style-type: none"> • Solve problems where a projectile is fired at any speed at any angle and from any height. <p>SM2.7</p> <ul style="list-style-type: none"> • Solve problems where particles are on rough inclined planes, either released from rest, or fired up a plane, or connected particles. • Solve problems that involve resolving and taking moments, such as ladder problems and rods resting on pegs. These problems may be on rough or smooth surfaces. <p>SM2.8</p> <ul style="list-style-type: none"> • Solve constant acceleration and projectile problems in terms of vectors. 	



	<ul style="list-style-type: none"> Derive the identities $\tan^2\theta + 1 = \sec^2\theta$ and $1 + \cot^2\theta = \operatorname{cosec}^2\theta$ and solve trig equations and proof problems involving them. P2.7 Solve simple problems involving addition formulae and double angle formulae. Understand the inverse trig graphs of $y=\sin^{-1}x$, $y=\cos^{-1}x$ and $y=\tan^{-1}x$ P2.8 Use algebraic skills and knowledge of the trig identities to convert between parametric and Cartesian equations. Differentiate a function given in parametric form. 	<ul style="list-style-type: none"> Understand the difference between static and dynamic problems and be able to solve these where you have to resolve forces into their components. Understand what is meant by the term 'limiting equilibrium' and how this applies to a question. 	<ul style="list-style-type: none"> Apply the formula for integration by parts in standard questions. Split a function into its partial fractions, and then integrate each part separately. Use integration to find the area under a curve using all of the above integration methods. Recognise when a function can't be integrated to find an area under a curve, and be able to apply the trapezium rule to it. Separate out a first order differential equation, to integrate each variable separately. 	<ul style="list-style-type: none"> Solve variable acceleration problems in terms of vectors. 	
<p>Complex Knowledge</p>	<p>P2.3</p> <ul style="list-style-type: none"> Use recurrence relationships to describe the relationship from one term to the next. Identify increasing and decreasing sequences. Model with series. P2.1 Recognise and know how to convert an improper fraction to a mixed fraction before expressing it in partial fractions. P2.7 Simplify and use $a\cos x \pm b\sin x$ Solve more complex problems using all of the above trig functions and identities. Solve modelling problems using the above trig skills. P2.8 Solve more complicated problems where the functions are given in terms of parametric equations. Use sophisticated mathematical language to successfully explain what they are doing as well as why they are doing it (in terms of mathematical modelling). 	<p>P2.2</p> <ul style="list-style-type: none"> Solve modulus problems using graphical as well as algebraic methods. P2.4 Use partial fractions to simplify expansions of more difficult expressions. SM2.1 Use two-tailed hypothesis tests for zero correlation. SM2.2 Calculate more complex conditional probabilities using Venn diagrams, probability formulae and tree diagrams. P2.9 Solve more complex problems using all the various differentiation skills including questions that involve modelling problems. SM2.4 Solve algebraic problems involving moments. SM2.5 Solve more complex static and dynamic problems, where R is given in terms of an unknown force. 	<p>SM2.3</p> <ul style="list-style-type: none"> Apply a continuity correction when calculating probabilities using a normal distribution to a binomial distribution. Perform hypothesis testing with the normal distribution. P2.12 Use vectors to solve problems in context. P2.11 Recognise which method of integration to use to solve a particular problem. Use sophisticated mathematical language to successfully explain what they are doing as well as why they are doing it. 	<p>P2.10</p> <ul style="list-style-type: none"> Apply numerical methods to find solutions to models of real-life situations. Derive and be able to apply the general formula for a projectile. Solve more complex/algebraic problems involving particles on planes. SM2.6 Solve complicated constant acceleration and projectile problems in vectors. SM2.8 Solve more complex variable acceleration problems in terms of vectors. 	



<p>Links with the National Curriculum <i>(Overarching Themes from the Specification)</i></p>	<ul style="list-style-type: none"> The overarching themes (a) mathematical argument, language and proof, b) mathematical problem solving, c) mathematical modelling) are applied throughout the programme of study and SoL. Links directly to Edexcel specification: Pure Mathematics topic 4 Sequences and series, topic 2 Algebra and functions and topic 5 Trigonometry. 	<ul style="list-style-type: none"> The overarching themes (a) mathematical argument, language and proof, b) mathematical problem solving, c) mathematical modelling) are applied throughout the programme of study and SoL. Links to Edexcel specification: Pure Mathematics topic 1 Proof, topic 2 Algebra and functions and topic 7 Differentiation Links to Edexcel specification: Statistics and Mechanics topic 2 Data presentation and interpretation, topic 3 Probability, topic 8 Forces and Newton's laws and topic 9 Moments. 	<ul style="list-style-type: none"> The overarching themes (a) mathematical argument, language and proof, b) mathematical problem solving, c) mathematical modelling) are applied throughout the programme of study and SoL. Links to Edexcel specification: Pure Mathematics topic 8 Integration and topic 10 Vectors. Links to Edexcel specification: Statistics and Mechanics topic 4 Statistical distributions and topic 5 Statistical hypothesis testing. 	<ul style="list-style-type: none"> The overarching themes (a) mathematical argument, language and proof, b) mathematical problem solving, c) mathematical modelling) are applied throughout the programme of study and SoL. Links to Edexcel specification: Pure Mathematics topic 9 Numerical methods. Links to Edexcel specification: Statistics and Mechanics topic 4 Statistical distributions, topic 5 Statistical hypothesis testing, topic 7 Kinematics and topic 8 Forces and Newton's laws. 	
<p>Literacy (including reading)</p>	<ul style="list-style-type: none"> Key terminology outlined throughout as part of Quality First Teaching (QFT). 	<ul style="list-style-type: none"> Key terminology outlined throughout as part of Quality First Teaching (QFT). 	<ul style="list-style-type: none"> Key terminology outlined throughout as part of Quality First Teaching (QFT). 	<ul style="list-style-type: none"> Key terminology outlined throughout as part of Quality First Teaching (QFT). 	
<p>Cultural Capital</p>	<ul style="list-style-type: none"> logical analysis, deduction, calculation within patterns and structures and where appropriate, use it to explain and control natural happenings and situations. Construct rigorous mathematical arguments, make deductions and inferences, assess the validity of mathematical arguments, explain their reasoning and use mathematical language and notation correctly in a wider context. Discussions about the origins of the trigonometric ratios and the historical developments around this. 	<ul style="list-style-type: none"> Translate problems in mathematical and nonmathematical contexts into mathematical processes 	<ul style="list-style-type: none"> Interpret and use a variety of statistical representations and consider the limitations these are can have for portraying accurate data. translate situations in context into mathematical models & use mathematical models 	<ul style="list-style-type: none"> Interpret and use a variety of statistical representations and consider the limitations these are can have for portraying accurate data. translate situations in context into mathematical models & use mathematical models logical analysis, deduction, calculation within patterns and structures and where appropriate, use it to explain and control natural happenings and situations. 	
<p>Social, Moral, Spiritual and Cultural Development</p>	<ul style="list-style-type: none"> In classrooms MWBs are used to help promote self-esteem and build self-confidence. Paired/small group discussions are integrated into lessons on a regular basis and students have the opportunity to work collaboratively and recognise that different learners can have different viewpoints/approaches. Within lessons, respect is encouraged and anything other than this is challenged. Mistakes are welcomed and used as discussion points to address misconceptions. A variety of approaches to solving problems are taught and discussed. Students are encouraged to develop strategies that work for them (linked to developing lifelong learners). E-safety is promoted through the blended learning opportunities (Google Classroom) and regular use of other online resources. 				
<p>Fundamental British Values</p>					
<p>Assessment</p>	<p>(To be started in Sept 2022): Formative Homework tasks & class based end of chapter mini-assessments based on combinations of:</p>	<p>Formative Homework tasks Class based end of chapter mini- assessments based on combinations of:</p>	<p>Formative Homework tasks</p>	<p>Formative Homework tasks</p>	



	<p>Pure Ch 1, 3, 5, 6 & 7</p> <p>Assessment 1: Pure content (P1.1-P1.12 + P1.14). Statistics content (SM1.1-SM1.6). Mechanics content (SM1.8, SM1.9, SM1.10) – Yr12 A Level Mathematics content coverage plus: Pure content P2.1, P2.3, P2.5-P2.8.</p>	<p>Stats Ch 1 Pure Ch 2, 4 & 9 Mechs Ch 4 & 5</p>	<p>Class based end of chapter mini-assessments based on combinations of: Stats Ch 2 Pure Ch 11 & 12</p> <p>Summative Mock Examinations 1: Pure content (P1.1-P1.12 + P1.14). Statistics content (SM1.1-SM1.6). Mechanics content (SM1.8, SM1.9, SM1.10) – Yr12 A Level Mathematics content coverage plus: Pure content P2.1-P2.9. Statistics content SM2.1, SM2.2. Mechanics content SM2.4, SM2.5.</p>	<p>Class based end of chapter mini-assessments based on combinations of: Pure Ch 10 Stats Ch 3 Mechs Ch 6, 7 & 8</p> <p>Summative Mock Examinations 2: Entire specification coverage due to concluding the course.</p>	
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