Beths Grammar School KS5 Mathematics Curriculum Map – Year 13 **Exam Board: Edexcel**

Term	INTENT	IMPLEMENTATION	IMPACT
	Substantive Knowledge This is the specific, factual content for the topic, which should be connected into a careful sequence of learning.	**Disciplinary Knowledge (Skills)** This is the action taken within a particular topic in order to gain substantive knowledge.	**Assessment opportunities** What assessments will be used to measure student progress? Evidence of how well students have learned the intended content.

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Autumn Term 1A Year 13	Pure Chapter 3: Sequences and Series • 3.1 Arithmetic Sequences • 3.2 Arithmetic Series • 3.3 Geometric Sequences • 3.4 Geometric Series • 3.5 Sum to Infinity • 3.6 Sigma Notation • 3.7 Recurrence Relations • 3.8 Modelling with Series Chapter 4: Binomial Expansion • 4.1 Expanding $(1 + x)^n$ • 4.2 Expanding $(a + bx)^n$ • 4.3 Using Partial Fractions Chapter 7: Trigonometry and Modelling • 7.1 Addition Formulae • 7.2 Using the Addition Formulae • 7.3 Double Angle Formulae	Chapter 3: Sequences and Series • Find the n^{th} term of an arithmetic sequence • Prove and use the formula for the sum of the first n terms of an arithmetic series • Find the n^{th} term of a geometric sequence • Prove and use the formula for the sum of a finite geometric series • Prove and use the formula for the sum to infinity of a convergent geometric series • Use sigma notation to describe series • Generate sequences from recurrence relations • Model real-life situations with sequences and series Chapter 4: Binomial Expansion • Expand $(1+x)^n$ for any rational constant n and determine the range of values of *x* for which the expansion is valid • Expand $(a + bx)^n$ for any rational constant n and determine the range of values of *x* for which the expansion is valid • Use partial fractions to expand fractional expressions Chapter 7: Trigonometry and Modelling • Prove and use the addition formulae • Understand and use the double-angle formulae • Solve trigonometric equations using the double-angle and addition formulae	• In class teacher assessment through Q&A • End of chapter mini test (with peer marking) • Chapter revision exercise via textbook • End of term review exercises via textbook • End of term formal mixed chapter assessment • Mymaths topic codes: 3.2: 2039 3.4: 2040 3.6: 2038 3.7: 2264 4.2: 2204, 2204 4.3: 2205, 2205 Review chapter 4: 3007 7.2: 2157 7.3: 2158 7.4: 3044 7.5: 2159, 2160, 3025 9.2: 2161 9.3: 2162 9.4: 2163 9.5: 2164 9.6: 2165, 2272 9.7: 2222 9.8: 2223

	• 7.4 Solving Trigonometric Equations • 7.5 Simplifying acos x ± bsin x • 7.6 Proving Trigonometric Identities • 7.7 Modelling with Trigonometric Functions <u>Chapter 9: Differentiation</u> • 9.1 Differentiating sin x and cos x • 9.2 Differentiating Exponentials and Logarithms • 9.3 The Chain Rule • 9.4 The Product Rule • 9.5 The Quotient Rule • 9.6 Differentiating Trigonometric Functions • 9.7 Parametric Differentiation • 9.8 Implicit Differentiation • 9.9 Using Second Derivatives • 9.10 Rates of Change	• Write expressions of the form a cos θ ± b sin θ in the forms Rcos ($\theta \pm \alpha$) or Rsin($\theta \pm \alpha$) • Prove trigonometric identities using a variety of identities • Use trigonometric functions to model real-life situations <u>Chapter 9: Differentiation</u> • Differentiate trigonometric functions • Differentiate exponentials and logarithms • Differentiate functions using the chain, product and quotient rules • Differentiate parametric equations • Differentiate functions which are defined implicitly • Use the second derivative to describe the behaviour of a function • Solve problems involving connected rates of change and construct simple differential equations	9.9: 2271 9.10: 2166 Revision chapter 9: 3005, 3036

Autumn Term 1B Year 13	<u>Chapter 8: Parametric Equations</u> • 8.1 Parametric Equations • 8.2 Using Trigonometric Identities • 8.3 Curve Sketching • 8.4 points of Intersection • 8.5 Modelling with Parametric Equations <u>Chapter 10: Numerical Methods</u> • 10.1 Locating Roots • 10.2 Iteration • 10.3 The Newton-Raphson Method • 10.4 Applications to Modelling <u>Chapter 11: Integration</u> • 11.1 Integrating Standard Functions • 11.2 Integrating f(ax + b) • 11.3 Using Trigonometric Identities • 11.4 Reverse Chain Rule • 11.5 Integration by Substitution • 11.6 Integration by Parts • 11.7 Partial Fractions • 11.8 Finding Areas • 11.9 The Trapezium Rule	<u>Chapter 8: Parametric Equations</u> • Convert parametric equations into Cartesian form by substitution • Convert parametric equations into Cartesian form using trigonometric identities • Understand and use parametric equations of curves and sketch parametric curves • Solve coordinate geometry problems involving parametric equations • Use parametric equations in modelling in a variety of contexts <u>Chapter 10: Numerical Methods</u> • Locate roots of f(x) = 0 by considering changes of sign • Use iteration to find an approximation to the root of the equation f(x) = 0 • Use the Newton-Raphson procedure to find approximations to the solutions of the equations of the form f(x) = 0 • Use numerical methods to solve problems in context <u>Chapter 11: Integration</u> • Integrate standard mathematical functions including trigonometric and exponential functions and use the reverse chain rule to integrate functions of the form f(ax + b) • Use trigonometric identities in integration • Use the reverse chain rule to integrate more complex functions • Integrate functions by making a substitution, using integration by parts and using partial fractions • Use integration to find the area under a curve	• In class teacher assessment through Q&A • End of chapter mini test (with peer marking) • Chapter revision exercise via textbook • End of term review exercises via textbook • End of term formal assessments • Mastery homework with use of mymaths.co.uk • Mymaths topic codes: 8.1: 2224 8.2: 2262 8.3: 2224 Review 8.1-3: 3037 10.1: 2173 10.2: 2174 10.3: 2176 Chapter 10 revision: 3047 11.1: 2167 11.2: 2168, 2170 11.3: 2218 11.4: 2216 11.5: 2219, 2169 11.6: 2171, 2220 11.7: 2217, 2221

	• 11.10 Solving Differential Equations • 11.11 Modelling with Differential Equations • 11.12 Integration as the Limit of a Sum <u>Chapter 12: Vectors</u> • 12.1 3D coordinates • 12.2 Vectors in 3D • 12.3 Solving Geometric Problems • 12.4 Application to Mechanics	• Use the trapezium rule to approximate the area under a curve • Solve simple differential equations and model real-life situations with differential equations <u>Chapter 12: Vectors</u> • Understand 3D Cartesian coordinates • Use vectors in three dimensions • Use vectors to solve geometric problems • Model 3D motion in mechanics with vectors	11.9: 2060 11.11: 2226, 2227 Chapter 11 revision: 3028, 3046, 3038 12.2: 2208 End of Year 2 Review: 3031
Spring Term 2A Year 13	<u>Statistics</u> <u>Chapter 1: Regression, Correlation and Hypothesis testing</u> • 1.1 Exponential Models • 1.2 Measuring Correlation • 1.3 Hypothesis testing for Zero Correlation <u>Mechanics</u> <u>Chapter 5: Forces and Friction</u> • 5.1 Resolving Forces • 5.2 Inclined Planes • 5.3 Friction <u>Chapter 6: Projectiles</u> • 6.1 Horizontal Projection • 6.2 Horizontal and Vertical Components	<u>Statistics</u> <u>Chapter 1: Regression, Correlation and Hypothesis Testing</u> • Understand exponential models in bivariate data • Use a change of variable to estimate coefficients in an exponential model • Understand and calculate the product moment correlation coefficient • Carry out a hypothesis test for zero correlation <u>Mechanics</u> <u>Chapter 5: Forces and Friction</u> • Resolve forces into components • Use the triangle law to find a resultant force • Solve problems involving smooth or rough inclined planes • Understand friction and the coefficient of friction • Use $F \leq \mu R$ <u>Chapter 6: Projectiles</u> • Model motion under gravity for an object projected horizontally • Resolve velocity into components	• In class teacher assessment through Q&A • End of chapter mini test (with peer marking) • Chapter revision exercise via textbook • End of term review exercises via textbook • End of term formal assessments • Mastery homework with use of mymaths.co.uk • Mymaths topic codes: 1.3: 2287 5.1: 2190 5.2: 2191,2192 5.3: 2193, 2194 Chapter 5 revision: 3034, 3035

	• 6.3 Projection at any angle • 6.4 Projectile Motion Formulae <u>Chapter 7: Applications of Forces</u> • 7.1 Static Particles • 7.2 Modelling with Statics • 7.3 Friction and Static Particles • 7.4 Static Rigid Bodies • 7.5 Dynamics and Inclined Planes • 7.6 Connected Particles	• Solve problems involving particles projected at an angle • Derive the formulae for time of flight, range and greatest height, and the equation of the path of a projectile <u>Chapter 7: Applications of Forces</u> • Find an unknown force when a system is in equilibrium • Solve statics problems involving weight, tension and pulleys • Understand and solve problems involving limiting equilibrium • Solve problems involving motion on rough or smooth inclined planes • Solve problems involving connected particles that require the resolution of forces	6.1: 6.2: 2198 6.3: 2199,3041
Spring Term 2B Year 13	<u>Statistics</u> <u>Chapter 2: Conditional Probability</u> • 2.1 Set Notation • 2.2 Conditional Probability • 2.3 Conditional Probabilities in Venn diagrams • 2.4 Probability Formulae • 2.5 Tree Diagrams <u>Chapter 3: The Normal Distribution</u> • 3.1 The Normal Distribution • 3.2 Finding Probabilities for Normal Distributions • 3.3 The Inverse Normal Distribution function • 3.4 The Standard Normal Distribution	<u>Chapter 2: Conditional Probability</u> • Understand set notation in probability • Understand conditional probability • Solve conditional probability problems using two-way tables and Venn diagrams • Use probability formulae to solve problems • Solve conditional probability using tree diagrams <u>Chapter 3: The Normal Distribution</u> • Understand the normal distribution and the characteristics of a normal distribution curve • Find percentage points on a standard normal curve • Calculate values on a standard normal curve • Find unknown means and/or standard deviations for a normal distribution	• In class teacher assessment through Q&A • End of chapter mini test (with peer marking) • Chapter revision exercise via textbook • End of term review exercises via textbook • End of term formal assessments • Mastery homework with use of mymaths.co.uk • Mymaths topic codes: Chapter 2 revision: 3251

	• 3.5 Finding μ and σ • 3.6 Approximating a binomial Distribution 3.7 Hypothesis testing with the Normal Distribution <u>Mechanics</u> <u>Chapter 4: Moments</u> • 4.1 Moments • 4.2 Resultant Moments • 4.3 Equilibrium • 4.4 Centres of Mass • 4.5 Tilting <u>Chapter 8: Further Kinematics</u> • 8.1 Vectors in Kinematics • 8.2 Vector methods with projectiles • 8.3 Variable acceleration in one Dimension • 8.4 Differentiating Vectors • 8.5 Integrating Vectors	• Approximate a binomial distribution using a normal distribution • Select appropriate distributions and solve real-life problems in context • Carry out a hypothesis test for the mean of a normal distribution <u>Mechanics</u> <u>Chapter 4: Moments</u> • Calculate the turning effect of a force applied to a rigid body • Calculate the resultant moment of a set of forces acting on a rigid body • Solve problems involving uniform rods in equilibrium • Solve problems involving non-uniform rods • Solve problems involving rods on the point of tilting <u>Chapter 8: Further Kinematics</u> • Work with vectors for displacement, velocity and acceleration when using the vector equations of motion • Use calculus with harder functions of time involving variable acceleration • Differentiate and integrate vectors with respect to time	3.1: 2120(Q1) 3.2: 2121 3.3: 2292 3.4: 2120(Q2) 3.6: 2286 3.7: 2288 Chapter 3 revision: 3020 4.3: 2197, 3040 8.1: 2290 8.3: 3254 8.4: 2291
Summer Term 3A Year 13	Revision and Exams	Exam Technique and Exam Questions	
Summer Term 3B Year 13	Exams		

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