



The curriculum for this stage of students' education has been designed to:

build upon their knowledge of algebra by increasing rigour with the introduction of formal proof. The study of calculus will see students being able to calculate gradients of non-linear functions using differentiation and also calculate areas under curves accurately using integration. In the second term, students will have the opportunity to apply their study of calculus to calculate forces and motion, as well as studying how to interpret data using more formal probability models compared to their prior stage of study. Throughout the statistics module, students will have the opportunity to study a large data set and become familiar with how to use the techniques developed in class to analyse it. Throughout the year, students will be exposed to regular exam questions and exam papers to prepare them fully for their exam at the end of the year. Underpinning the curriculum areas, will be the opportunity to explore how the skills they are developing can be used in real life situations and applied to problem solving questions.

Half Term 1	BASELINE AND ALGEBRA	Half Term 2	Trigonometry and Vectors	Half Term 3	CALCULUS AND LOGARITHMS
Students Must know: The importance of rigour in mathematics including • Algebraic expressions – basic algebraic manipulation, indices and surds • Quadratic functions – factorising, solving, graphs and the discriminants • Equations – quadratic/linear simultaneous • Inequalities – linear and quadratic (including graphical solutions) • Graphs – cubic, quartic and reciprocal • Transformations – transforming graphs – $f(x)$ notation • Algebraic division, factor theorem and proof • The binomial expansion • Straight-line graphs, parallel/perpendicular, length and area problems • Circles – equation of a circle, geometric problems on a grid		Students Must know: The importance of trigonometry including • Trigonometric ratios and graphs • Trigonometric identities and equations How to use vectors including • Definitions, magnitude/direction, addition and scalar multiplication • Position vectors, distance between two points, geometric problems		Students Must know: The importance of gradient including • Definition, differentiating polynomials, second derivatives • Gradients, tangents, normals, maxima and minima How to use integration including • Definition as opposite of differentiation, indefinite integrals of x^n • Definite integrals and areas under curves How to calculate with exponentials and logarithms including • The laws of logarithms. • Exponential functions and processes. • Curve fitting.	
How this will be assessed: Baseline assessment in week 2. Combined end of unit assessments in week 5.		How this will be assessed: Summative assessment in week 1 and week 5. End of term assessment in week 6/7.		How this will be assessed: Summative assessment in week 4.	
Half Term 4	Statistics	Half Term 5	Statistics	Half Term 6	Algebra
Students Must know: How to collect and interpret data including • Sampling techniques. • Central tendency and spread. • Single-variable and bivariate data. How to calculate probability using a distribution including • Binomial distribution. How to conduct a hypothesis test including • Formulating a test. • Calculating and using the critical region.		Students Must know: How to interpret correlation within hypothesis testing including • Correlation coefficients. • Using given p values or critical values to assess significance. How to calculate probability including: • Using mutually exclusive, independent and conditional events. • Applying tree diagrams, Venn diagrams and two way tables. • Using the conditional probability formula. • Linking probability to discrete and continuous distributions. • Modelling with probability, including critiquing assumptions and considering the impact of more realistic assumptions. How to use a Normal distribution including: • Modelling data with Normal curves • Finding Normal probabilities • Linking to key statistics • Choosing suitable distributions • Performing Normal mean hypothesis tests		Students Must know: The importance of rigour in mathematics including • Mathematical proof. • Functions and parametric equations. • Partial fractions. • Algebraic fractions.	
How this will be assessed: Summative assessment in week 1. End of term assessment in final week.		How this will be assessed:		How this will be assessed: Summative assessment (statistics) in week 1. Mock exam (AS-level) in June.	

Embedding this knowledge can be supported at home by:

Embedding this knowledge can be supported at home by encouraging students to practise core skills regularly through short, frequent problem solving sessions, discussing their mathematical thinking out loud to strengthen oracy and reasoning, reviewing class notes and worked examples to improve mathematical reading, and completing written solutions that show clear steps and justification to develop strong mathematical writing; families can also support by helping students build good study habits, encouraging them to use online tools such as Desmos or GeoGebra for visualisation, and linking topics like integration, modelling and numerical methods to real world contexts such as finance, science, engineering or everyday problem solving.