





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.

<p><b>HALF TERM 1: ALGEBRA</b></p> <p><b>STUDENTS MUST KNOW:</b> The importance of rigour in mathematics including</p> <ul style="list-style-type: none"> <li>• Argument and proof.</li> <li>• Quadratics and surds.</li> <li>• Binomial theorem.</li> </ul> <p>How to calculate angles and lengths of triangles including</p> <ul style="list-style-type: none"> <li>• Cosine and sine rule.</li> <li>• Solving trigonometric equations over a range.</li> </ul> <p><b>HOW THIS WILL BE ASSESSED:</b> Assessments following each topic will be conducted as well as a mock exam each term.</p>	<p><b>HALF TERM 2: CALCULUS</b></p> <p><b>STUDENTS MUST KNOW:</b> The importance of gradient in mathematics including</p> <ul style="list-style-type: none"> <li>• Differentiation from first principles and Leibniz notation.</li> <li>• Tangents, normals and turning points.</li> <li>• Integration to find area under a curve.</li> </ul> <p>How to calculate with exponentials and logarithms including</p> <ul style="list-style-type: none"> <li>• The laws of logarithms.</li> <li>• Exponential functions and processes.</li> <li>• Curve fitting.</li> </ul> <p><b>HOW THIS WILL BE ASSESSED:</b> Assessments following each topic will be conducted as well as a mock exam each term.</p>	<p><b>HALF TERM 3: MECHANICS</b></p> <p><b>STUDENTS MUST KNOW:</b> How to use vectors including</p> <ul style="list-style-type: none"> <li>• Definitions, properties and components of a vector.</li> </ul> <p>How to use equations of motion including</p> <ul style="list-style-type: none"> <li>• Motion in a straight line.</li> <li>• Equations of motion for constant and variable acceleration.</li> </ul> <p>The importance of forces including</p> <ul style="list-style-type: none"> <li>• Newton's laws.</li> <li>• Motion under gravity and systems of forces.</li> </ul> <p><b>HOW THIS WILL BE ASSESSED:</b> Assessments following each topic will be conducted as well as a mock exam each term.</p>
<p><b>HALF TERM 4: STATISTICS</b></p> <p><b>STUDENTS MUST KNOW:</b> How to collect and interpret data including</p> <ul style="list-style-type: none"> <li>• Sampling techniques.</li> <li>• Central tendency and spread.</li> <li>• Single-variable and bivariate data.</li> </ul> <p>How to calculate probability using a distribution including</p> <ul style="list-style-type: none"> <li>• Binomial distribution.</li> </ul> <p>How to conduct a hypothesis test including</p> <ul style="list-style-type: none"> <li>• Formulating a test.</li> <li>• Calculating and using the critical region.</li> </ul> <p><b>HOW THIS WILL BE ASSESSED:</b> Assessments following each topic will be conducted as well as a mock exam each term.</p>	<p><b>HALF TERM 5:</b></p> <p><b>STUDENTS MUST KNOW:</b> How to apply their knowledge of the content learnt to exam style questions.</p> <p><b>HOW THIS WILL BE ASSESSED:</b> Assessments following each topic will be conducted as well AS level Mathematics examination in May;</p>	<p><b>HALF TERM 6:</b></p> <p><b>STUDENTS MUST KNOW:</b> The importance of rigour in mathematics including</p> <ul style="list-style-type: none"> <li>• Mathematical proof.</li> <li>• Functions and parametric equations.</li> <li>• Partial fractions.</li> <li>• Algebraic fractions.</li> </ul> <p><b>HOW THIS WILL BE ASSESSED:</b> Assessments following each topic will be conducted as well AS level Mathematics examination in May/June.</p>



Embedding this knowledge can be supported at home by accessing the online textbook Kerboodle, using the AQA website to access past exam questions and using [www.mathsgenie.co.uk](http://www.mathsgenie.co.uk) to review topics that we study in class.