



The curriculum for this stage of students' education has been designed to build upon their knowledge of calculus by increasing their skill set for differentiation and integration. Students will spend time studying how to use inverse and reciprocal trigonometric functions and also convert compound angles using trigonometric identities. In the second term, students will advance from trial and improvement seen at GCSE to use more rigorous and reliable numerical methods to find approximations to equations. The mechanics modules will build upon the AS level by looking at systems of forces in motion as well as introducing gravity. Students will continue to analyse the large data set, this time looking at how to manipulate continuous data and use hypothesis testing to determine if correlation is significant. 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>  <b>STUDENTS MUST KNOW:</b>                      The importance of sequences including</p> <ul style="list-style-type: none"> <li>• Binomial series.</li> <li>• Arithmetic and geometric sequences.</li> </ul> <p>How to manipulate trigonometric functions including</p> <ul style="list-style-type: none"> <li>• Working in radians.</li> <li>• Compound angles.</li> <li>• Reciprocal and inverse trigonometric functions.</li> <li>• Equivalent forms of <math>a\cos x + b\sin x</math>.</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>  <b>STUDENTS MUST KNOW:</b>                      How to calculate more complex differentiation including</p> <ul style="list-style-type: none"> <li>• Trigonometric and exponential functions.</li> <li>• Product, quotient and chain rule.</li> <li>• Implicit differentiation and parametric functions.</li> </ul> <p>How to calculate more complex integration including</p> <ul style="list-style-type: none"> <li>• Integration by substitution and parts.</li> <li>• Integration of rational functions.</li> <li>• Differential equations.</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>  <b>STUDENTS MUST KNOW:</b>                      The importance of using numerical methods including</p> <ul style="list-style-type: none"> <li>• Iterative root finding.</li> <li>• Newton-Raphson root finding.</li> <li>• Numerical integration.</li> </ul> <p>How to calculate motion in two dimensions including</p> <ul style="list-style-type: none"> <li>• Two-dimensional motion with constant and variable acceleration.</li> <li>• Motion under gravity and motion under 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: MECHANICS/ STATISTICS</b>  <b>STUDENTS MUST KNOW:</b>                      How to calculate simple systems of forces including</p> <ul style="list-style-type: none"> <li>• 3D vectors.</li> <li>• Forces in equilibrium (statics).</li> <li>• Forces in motion (dynamics).</li> <li>• Moments.</li> </ul> <p>The importance of probability distributions for continuous data including</p> <ul style="list-style-type: none"> <li>• Conditional probability.</li> <li>• The normal distribution.</li> <li>• The normal distribution as a model for the binomial.</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: STATISTICS</b>  <b>STUDENTS MUST KNOW:</b>                      How to conduct a hypothesis test for a continuous distribution, including</p> <ul style="list-style-type: none"> <li>• Testing correlation.</li> <li>• Hypothesis testing for a normal distribution.</li> </ul> <p>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 A level Mathematics examination in May/June.</p>	<p><b>HALF TERM 6:</b>  <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 A 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.