

# Subject: Further Maths Curriculum



William Hulme's Grammar School  
The best in everyone™  
Part of Unacademy Learning

## Year 13

<b>Overview</b>	<p>Maths Further Maths A Level (MEI)</p> <p>Developed in collaboration with Mathematics in Education and Industry (MEI), the new A Level Further Mathematics B (MEI) qualification offers a coherent course of study to develop students' mathematical understanding and skills, encouraging them to think, act and communicate mathematically. It provides a solid foundation for further study in mathematics and also for those studying Computer Science, Finance, Engineering and the Physical Sciences other disciplines that make extensive use of mathematical skills</p>
-----------------	---

	Half Term 1	Half Term 2	Assessment
<b>Autumn Term</b>	<p><b>Pure Maths</b></p> <p><b>Vectors:</b></p> <ul style="list-style-type: none"> <li>■ Lines and planes</li> </ul> <p><b>Vector Product:</b></p> <ul style="list-style-type: none"> <li>■ Multiplying vectors to get a vector solution.</li> </ul> <p><b>Matrices:</b></p> <ul style="list-style-type: none"> <li>■ Matrices and the intersection of planes.</li> </ul> <p><b>Series and induction:</b></p> <ul style="list-style-type: none"> <li>■ Method of differencing to sum series.</li> <li>■ Further proof by induction.</li> </ul> <p><b>Further Calculus:</b></p> <ul style="list-style-type: none"> <li>■ Using inverse trigonometric functions and partial fractions to integrate.</li> </ul> <p><b>Applied option 1 Mechanics Major.</b></p> <ul style="list-style-type: none"> <li>■ Motion under variable force</li> <li>■ Circular motion</li> </ul> <p><b>Applied option 2 Modelling with Algorithms</b></p> <ul style="list-style-type: none"> <li>■ Introduction to algorithms</li> <li>■ Introduction to networks</li> <li>■ Network algorithms</li> </ul>	<p><b>Pure Maths</b></p> <p><b>Polar Coordinates:</b></p> <ul style="list-style-type: none"> <li>■ Graphs expressed in terms of a radius and an angle not x and y.</li> </ul> <p><b>Maclaurin Series:</b></p> <ul style="list-style-type: none"> <li>■ Deriving series that can approximate to common functions.</li> </ul> <p><b>Hyperbolic Functions:</b></p> <ul style="list-style-type: none"> <li>■ Functions based on the hyperbola <math>x^2 - y^2 = 1</math></li> </ul> <p><b>Applied option 1 Mechanics Major.</b></p> <ul style="list-style-type: none"> <li>■ Hook's Law</li> <li>■ Modelling oscillations</li> </ul> <p><b>Applied option 2 Modelling with Algorithms</b></p> <ul style="list-style-type: none"> <li>■ Further networks</li> <li>■ Linear programming</li> <li>■</li> </ul>	<p>We do a assessment in the first week after half term. One Further Pure paper and a mixed further applied paper.</p> <p>December mocks, a formal assessment takes place just before the end of HT2. Four papers Further Pure, Statistics minor, Mechanics minor and either Modelling with algorithms or Mechanics major.</p>

	Half Term 3	Half Term 4	Assessment
<b>Spring Term</b>	<p><b>Applications of Integration:</b></p> <ul style="list-style-type: none"> <li>■ Volumes, mean of a function and general integration</li> </ul> <p><b>First Order Differential Equations:</b></p> <ul style="list-style-type: none"> <li>■ Equations in terms of variables and a first differential (eg x, y and dy/dx)</li> </ul> <p><b>Applied option 1 Mechanics Major.</b></p> <ul style="list-style-type: none"> <li>■ Further Centres of Mass</li> </ul> <p><b>Applied option 2 Modelling with Algorithms</b></p> <ul style="list-style-type: none"> <li>■ The Simplex method</li> </ul>	<p><b>Complex Numbers:</b></p> <ul style="list-style-type: none"> <li>■ Powers and Roots of complex numbers. The exponential form (e to the i theta)</li> <li>■ Summing series of sin or cos by going through the complex plane.</li> </ul> <p><b>Applied option 1 Mechanics Major.</b></p> <ul style="list-style-type: none"> <li>■ Oblique impact</li> </ul> <p><b>Applied option 2 Modelling with Algorithms</b></p> <ul style="list-style-type: none"> <li>■ Network problems as linear programming problems</li> </ul>	<p>Full Mock exams in all modules (Further Pure, Statistics minor, Mechanics minor and either Modelling with algorithms or Mechanics major.) after half term.</p>

	Half Term 5	Half Term 6	Assessment
Summer Term	<p><b>Second Order Differential Equations:</b></p> <ul style="list-style-type: none"> <li>Equations with second differentials (<math>d^2y/dx^2</math>).</li> </ul> <p><b>Statistics Recap:</b></p> <ul style="list-style-type: none"> <li>Recap of year 1 statistics.</li> <li>External Exams (Further Core pure is usually before half term)</li> </ul>	<ul style="list-style-type: none"> <li><b>External Exams</b></li> </ul>	Preparation test at start of HT5.

Useful Resources for Supporting Your Child at Home:	Homework:
<p><a href="https://integralmaths.org/">https://integralmaths.org/</a>  <a href="https://www.padlet.com/">KS5 RESOURCES (padlet.com)</a></p>	<p>Homework is much more extensive, and we expect students to take control of their own work and spend longer on it (a minimum of 300 mins per week).</p> <p>Minimum Expectations are:</p> <ul style="list-style-type: none"> <li>All questions especially "P" &amp; "E" questions from exercises in the textbooks are to be completed self-marked and corrected.</li> <li>All MEI Section test to be completed online this is marked by the online program</li> <li>When requested Topic Assessment tests and exam practice questions might be set by teachers.</li> </ul> <p>Other Topic specific questions are available in Class Material in Teams.</p>