



# Years 12 & 13 Curriculum

## A Level: Mathematics



Pure Mathematics					
Topic	Proof	Coordinate Geometry in x-y Plane	Sequences & Series	Trigonometry	Exponentials & Logarithms
<b>Key Concepts</b>	<ul style="list-style-type: none"> <li>Nature of proof</li> <li>Proof by deduction</li> <li>Proof by exhaustion</li> <li>Proof by contradiction</li> </ul>	<ul style="list-style-type: none"> <li>Equations of lines and circles</li> <li>Plotting of curves</li> <li>Midpoints and lengths of line segments</li> </ul>	<ul style="list-style-type: none"> <li>Geometric and arithmetic sequences</li> <li>Convergence and divergence</li> <li>Recurrence relationships</li> </ul>	<ul style="list-style-type: none"> <li>Sine and cosine rule</li> <li>Trigonometric identities</li> <li>Trigonometric equations</li> </ul>	<ul style="list-style-type: none"> <li>Definitions and rules of manipulation</li> <li>Graphs of exp and logs</li> <li>Solving equations using logs</li> </ul>

Topic	Differentiation	Integration	Numerical Methods	Vectors	Algebra & Function
<b>Key Concepts</b>	<ul style="list-style-type: none"> <li>First principles</li> <li>Standard functions</li> <li>Chain, product and quotient rules</li> </ul>	<ul style="list-style-type: none"> <li>Reverse of differentiation</li> <li>Standard functions and patterns</li> <li>By substitution</li> <li>By parts</li> </ul>	<ul style="list-style-type: none"> <li>Location of roots</li> <li>Fixed point iteration</li> <li>Newton Raphson method</li> </ul>	<ul style="list-style-type: none"> <li>2D and 3D</li> <li>Geometric use of vectors</li> <li>Magnitude and direction</li> <li>Position vectors</li> </ul>	<ul style="list-style-type: none"> <li>Function notation</li> <li>Domain and range</li> <li>Algebraic techniques</li> </ul>

Statistics					
Topic	Data Representation & Interpretation	Statistical Sampling	Probability	Statistical Distributions	Statistical Hypothesis Testing
<b>Key Concepts</b>	<ul style="list-style-type: none"> <li>Histograms</li> <li>Stem and leaf</li> <li>Data set analysis</li> <li>Cumulative frequency curves</li> <li>Correlation</li> </ul>	<ul style="list-style-type: none"> <li>Types of sampling</li> <li>Sampling errors</li> <li>Uses of sampling</li> </ul>	<ul style="list-style-type: none"> <li>Nature of probability</li> <li>Venn diagrams</li> <li>Conditional probability</li> <li>Decision trees</li> </ul>	<ul style="list-style-type: none"> <li>Binomial distribution</li> <li>Normal distribution</li> <li>Discrete distributions</li> </ul>	<ul style="list-style-type: none"> <li>One tailed and two tailed tests</li> <li>Confidence intervals</li> <li>Test for binomial fit</li> <li>Test of correlation</li> </ul>

Mechanics				
Topic	Quantities & Units in Mechanics	Kinematics	Forces & Newton's laws	Moments
<b>Key Concepts</b>	<ul style="list-style-type: none"> <li>Definitions of key units</li> <li>Dimension analysis</li> </ul>	<ul style="list-style-type: none"> <li>Constant acceleration</li> <li>SUVAT</li> <li>Projectiles</li> <li>Vector analysis</li> <li>Variable acceleration</li> </ul>	<ul style="list-style-type: none"> <li><math>F=ma</math></li> <li>Resolving of forces into components</li> <li>Friction</li> <li>Static particles</li> <li>Inclined planes</li> <li>Pulleys</li> </ul>	<ul style="list-style-type: none"> <li>Turning forces</li> <li>Stable systems</li> </ul>



# Years 12 & 13 Assessment

## A Level: Mathematics



All students will sit an assessment and a mock examination in Year 12 and two mock examinations in Year 13.

	Year 12		Year 13		Revision Resources
	Assessment	Mock Exam	Mock Exam	Mock Exam	
	Autumn Term	Summer Term	Autumn Term	Spring Term	
Style of Assessment	<b>Paper 1:</b> Pure <b>Paper 2:</b> Applied	<b>Paper 1:</b> Pure <b>Paper 2:</b> Applied	<b>Paper 1:</b> Pure <b>Paper 2:</b> Applied <b>Paper 3:</b> A Level Pure Topics	<b>Paper 1:</b> Pure <b>Paper 2:</b> Pure <b>Paper 3:</b> Applied	<i>Kennet Resources</i> <ul style="list-style-type: none"> <li>Core Questions</li> <li>Knowledge Organisers</li> <li>Learning Habits</li> </ul>
Topics Assessed	<b>Paper 1:</b> <i>Pure: Pure content (taught up to this point in the year)</i>  <b>Paper 2:</b> <i>Applied: All statistics topics (taught up to this point in the year)</i>	<b>Paper 1:</b> <i>Pure: Pure content (all topics covered during Year 12)</i>  <b>Paper 2:</b> <i>Applied: Statistics &amp; Mechanics (all topics covered during Year 12)</i>	<b>Papers 1 &amp; 2:</b> <i>All Pure topics (all topics covered during Year 12)</i>  <b>Paper 3:</b> <ul style="list-style-type: none"> <li>Algebraic &amp; partial fractions</li> <li>Sequences and series: arithmetic and geometric, sums of series, recurrence relations and iterations</li> <li>Functions: Modulus; composite and inverse; transformations and modelling</li> <li>Proof: including proof by deduction and contradiction</li> <li>Trigonometry: Radians, arc and sector; small angle approximations; secant, cosecant &amp; cotangent definitions &amp; graphs &amp; inverse trigonometric functions; compound angle formulae &amp; double angle rules with proof; binomial theorem with negative and fractional powers and link to partial fractions; vectors in 3 dimensions including unit vectors</li> </ul>	<b>Papers 1 &amp; 2:</b> <i>All pure topics taught (since the start of Year 12)</i>  <b>Paper 3:</b> Applied - All Statistics & Mechanics topics taught (since the start of Year 12)	<i>External Resources</i> <ul style="list-style-type: none"> <li><a href="http://www.mymaths.co.uk">www.mymaths.co.uk</a></li> <li><a href="http://www.amsp.org.uk">www.amsp.org.uk</a></li> <li><a href="http://www.integralmaths.org">www.integralmaths.org</a></li> </ul>