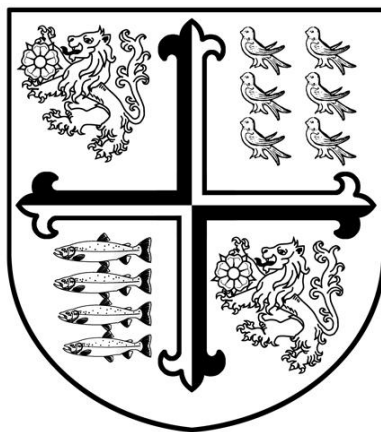




## **A Level Mathematics Exam Preparation**

Exam Board: Pearson Edexcel

Specification: 9MA0

[A level Mathematics Specification](#)

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## Year 13 Mathematics: Units and Assessment Criteria

### Key information:

### Teaching schedule

- Teacher A and Teacher B both teach Yr 2 Pure content, but different topics. It is not taught linearly.  
(i.e: In weeks 1 to 3, Teacher A covers Chapter 3 while Teacher B covers Chapter 5 and makes a start on Chapter 6).
- Once the Yr 2 Pure content is taught:
  - Teacher A covers mechanics (Yr 2 Applied Chapters 4 – 8)
  - Teacher B covers statistics (Yr 2 Applied Chapters 1 – 3)
- Once the Yr 2 Applied content is taught, classes will revise based on QLA from mocks

### Assessment schedule

- At the end of each Chapter there is a short assessment (dates given in document)
- The January Mock exam will be a full A-level Pure paper and an AS-level Applied paper
- The Easter Mock exam will be a full Pure AS-level paper
- The April Applied Mock exam will be a full Applied A-level paper

## Teacher A

| Unit and Duration                                                                                                                                                                                | Criteria for Success                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Assessment Information                                                               |
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| <b>Pure Year 2 Chapter 3 – Sequences and Series</b><br>w/c 7 <sup>th</sup> September<br>Arithmetic and geometric sequences and series, sums to infinity, recurrence relations and sigma notation | <ul style="list-style-type: none"> <li>You will be able to find the <math>n^{th}</math> term of an arithmetic sequence</li> <li>You will be able to prove and use the formula for the sum of the first <math>n</math> terms of an arithmetic series</li> <li>You will be able to find the <math>n^{th}</math> term of a geometric sequence</li> <li>You will be able to prove and use the formula for the sum of a finite geometric series</li> <li>You will be able to prove and use the formula for the sum to infinity of a convergent geometric series</li> <li>You will be able to use sigma notation to describe series</li> <li>You will be able to generate sequences from recurrence relations</li> <li>You will be able to model real-life situation with sequences and series</li> </ul> | In class test (~70% skills, ~30% problem solving):<br>w/c 21 <sup>st</sup> September |
| <b>Pure Year 2 Chapter 7 – Trigonometry and Modelling</b><br>w/c 28 <sup>th</sup> September<br>Addition and double-angle formulae, the harmonic form, uses in modelling                          | <ul style="list-style-type: none"> <li>You will be able to prove and use the addition formulae</li> <li>You will be able to understand and use the double-angle formulae</li> <li>You will be able to solve trigonometric equations using the double-angle and addition formulae</li> <li>You will be able to write expressions of the form <math>a \cos \theta \pm b \sin \theta</math> in harmonic form</li> <li>You will be able to use the harmonic form in modelling</li> <li>You will be able to prove trigonometric identities using a variety of identities</li> <li>You will be able to use trigonometric functions to model real-life situations</li> </ul>                                                                                                                               | In class test (~70% skills, ~30% problem solving):<br>w/c 12 <sup>th</sup> October   |
| <b>Pure Year 2 Chapter 9 – Differentiation</b><br>w/c 19 <sup>th</sup> October<br>Further differential techniques, the 2 <sup>nd</sup> derivative, rates of change                               | <ul style="list-style-type: none"> <li>You will be able to differentiate trigonometric functions</li> <li>You will be able to differentiate exponentials and logarithms</li> <li>You will be able to differentiate composite functions using chain rule</li> <li>You will be able to differentiate using product and quotient rule</li> <li>You will be able to differentiate parametric equations</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                       | In class test (~70% skills, ~30% problem solving):<br>w/c 23 <sup>rd</sup> November  |

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|                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>You will be able to differentiate functions that are defined implicitly</li> <li>You will be able to use the 2<sup>nd</sup> derivative to describe the behaviour of a function</li> <li>You will be able to solve problems involving connected rates of change and construct simple differential equations</li> </ul>                                                                                                                                                                                  |                                                                        |
| <b>Pure Year 2 Chapter 12 – Vectors</b><br>w/c 23 <sup>rd</sup> November<br>Vectors techniques in 3 dimensions                                                                        | <ul style="list-style-type: none"> <li>You will be able to understand 3D Cartesian coordinates</li> <li>You will be able to use vectors in 3D</li> <li>You will be able to use vectors to solve geometric problems</li> <li>You will be able to model 3D motion in mechanics with vector</li> </ul>                                                                                                                                                                                                                                           | In class test (~70% skills, ~30% problem solving):<br>w/c 7th December |
| <b>Applied Year 2 Chapter 4 – Moments</b><br>w/c 11 <sup>th</sup> January<br>Moments of forces, resultant moments, uniform and non-uniform rods and rigid bodies                      | <ul style="list-style-type: none"> <li>You will be able to calculate the turning effect of a force applied to a rigid body</li> <li>You will be able to calculate the resultant moment of a set of forces acting on a rigid body</li> <li>You will be able to solve problems involving uniform rods in equilibrium</li> <li>You will be able to solve problems involving non-uniform rods</li> <li>You will be able to solve problems involving rods on the point of tipping</li> </ul>                                                       | In class test (~70% skills, ~30% problem solving):<br>w/c 25th January |
| <b>Applied Year 2 Chapter 5 – Forces and Friction</b><br>w/c 1 <sup>st</sup> February<br>Using the coefficient of friction, looking at friction on rough inclined planes, equilibrium | <ul style="list-style-type: none"> <li>You will be able to resolve forces into components</li> <li>You will be able to use the triangle law to find a result force or a force required to maintain equilibrium</li> <li>You will be able to use the coefficient of friction, and <math>F_r \leq \mu R</math></li> <li>You will be able to solve problems involving smooth inclined planes</li> <li>You will be able to solve problems involving rough inclined planes</li> <li>You will be able to understand limiting equilibrium</li> </ul> | In class test (~70% skills, ~30% problem solving):<br>w/c 8th February |
| <b>Applied Year 2 Chapter 6 – Projectiles</b><br>w/c 22 <sup>nd</sup> February<br>Projectile motion both horizontally and at any angle, subject to gravity only                       | <ul style="list-style-type: none"> <li>You will be able to model motion under gravity for an object projected horizontally</li> <li>You will be able to resolve velocity into components</li> <li>You will be able to solve problems involving particles projected at any angle</li> <li>You will be able to derive the formulae for time of flight, range and greatest height</li> </ul>                                                                                                                                                     | In class test (~70% skills, ~30% problem solving):<br>w/c 1st March    |

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|                                                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>You will be able to find the Cartesian equation of the path of a projectile</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                      |
| <b>Applied Year 2 Chapter 7 – Applications of Forces</b><br>w/c 8 <sup>th</sup> March<br>Application of forces to a variety of problems, involving moments, connected particles, limiting equilibrium, planes and Newton's laws | <ul style="list-style-type: none"> <li>You will be able to find an unknown force when a system is in equilibrium</li> <li>You will be able to solve statics problems involving weight, strings in tension and pulleys</li> <li>You will be able to understand and solve problems involving limiting equilibrium</li> <li>You will be able to solve problems involving motion on rough or smooth inclined planes</li> <li>You will be able to solve problems involving connected particles that require the resolution of forces</li> </ul> | In class test (~70% skills, ~30% problem solving):<br>w/c 12th April |

## Teacher B

| Unit and Duration                                                                                                                                                                                        | Criteria for Success                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Assessment Information                                                               |
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| <b>Pure Year 2 Chapter 5 – Radians</b><br>w/c 7 <sup>th</sup> September<br>Using radians as an angle measurement, uses in geometry, trigonometric equations and small angle approximations               | <ul style="list-style-type: none"> <li>You will be able to convert between degrees and radians and apply this to trigonometric graphs and their transformations</li> <li>You will know the exact values of angles measured in radians</li> <li>You will be able to find the arc length using radians</li> <li>You will be able to find the areas of sectors and segments using radians</li> <li>You will be able to solve trigonometric equations in radians</li> <li>You will be able to use approximate trigonometric values with <math>\theta</math> is small</li> </ul>                                                                                                                                                 | In class test (~70% skills, ~30% problem solving):<br>w/c 21 <sup>st</sup> September |
| <b>Pure Year 2 Chapter 6 – Trigonometric functions</b><br>w/c 21 <sup>st</sup> September<br>More trigonometric functions – reciprocals and inverses, additional identities, uses in equations and graphs | <ul style="list-style-type: none"> <li>You will be able to understand the definitions of secant, cosecant and cotangent</li> <li>You will be able to understand the graphs of secant, cosecant and cotangent and their domain and range</li> <li>You will be able to simplify expressions, prove simple identities and solve equations involving secant, cosecant and cotangent</li> <li>You will be able to prove and used <math>\sec^2 x \equiv 1 + \tan^2 x</math> and <math>\csc^2 x \equiv 1 + \cot^2 x</math></li> <li>You will be able to understand the restricted domain and range of inverse trigonometric functions</li> <li>You will be able to use inverse trigonometric functions and their graphs</li> </ul> | In class test (~70% skills, ~30% problem solving):<br>w/c 5th October                |
| <b>Pure Year 2 Chapter 8 – Parametric equations</b><br>w/c 5 <sup>th</sup> October<br>Parametric equations, domains and ranges                                                                           | <ul style="list-style-type: none"> <li>You will be able to convert parametric equations into Cartesian form by substitution</li> <li>You will be able to convert parametric equations into Cartesian form using trigonometric identities</li> <li>You will be able to understand and use parametric curves and sketch parametric curves</li> <li>You will be able to find the domain and range of parametrically defined functions</li> <li>You will be able to solve geometry problems involving parametric equations</li> </ul>                                                                                                                                                                                           | In class test (~70% skills, ~30% problem solving):<br>w/c 19th October               |

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|                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>You will be able to use parametric equations in modelling in a variety of contexts</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                         |
| <b>Pure Year 2 Chapter 10 – Numerical methods</b><br>w/c 19 <sup>th</sup> October<br>Methods for solving equations that cannot be solved analytically                                          | <ul style="list-style-type: none"> <li>You will be able to locate roots of <math>f(x) = 0</math> by considering changes of sign</li> <li>You will be able to use iteration to find an approximation to the root of an equation <math>f(x) = 0</math></li> <li>You will be able to use Newton-Raphson procedure to find approximations to the solutions of equations of the form <math>f(x) = 0</math></li> <li>You will be able to understand the advantages and disadvantages of each numerical method, including when they fail to find roots</li> <li>You will be able to use numerical methods to solve problems in context</li> </ul>                                                                                                                                                                                                                                                                                       | In class test (~70% skills, ~30% problem solving):<br>w/c 9th November  |
| <b>Pure Year 2 Chapter 11 – Integration</b><br>w/c 16 <sup>th</sup> November<br>Further integration techniques, trapezium rule, integration as a the limit of a sum and differential equations | <ul style="list-style-type: none"> <li>You will be able to integrate standard function, including trigonometric and exponential functions</li> <li>You will be able to use trigonometric identities to manipulate a function into an integrable form</li> <li>You will be able to use the reverse of the chain rule to integrate simple and more complex functions</li> <li>You will be able to use integration by substitution for both indefinite and definite integrals</li> <li>You will be able to use integration by parts for products of unrelated functions</li> <li>You will be able to use definite integrals to find the area under a curve</li> <li>You will be able to use the Trapezium rule to approximate the area under a curve</li> <li>You will be able to equate a limit of a sum to an integral</li> <li>You will be able to solve simple differential equations, and model real-life scenarios</li> </ul> | In class test (~70% skills, ~30% problem solving):<br>w/c 14th December |
| <b>Applied Year 2 Chapter 1 – Regression, Correlation and Hypothesis testing</b><br>w/c 18 <sup>th</sup> January<br>Correlation, testing for correlation, lines of regression                  | <ul style="list-style-type: none"> <li>You will be able to understand exponential models in bivariate data</li> <li>You will be able to use a change of variable to estimate coefficients in an exponential model</li> <li>You will be able to understand and calculate the product moment correlation coefficient (PMCC) for a sample</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | In class test (~70% skills, ~30% problem solving):<br>w/c 25th January  |

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|                                                                                                                                                                                                                           | <ul style="list-style-type: none"> <li>You will be able to carry out a hypothesis test for zero correlation</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                        |
| <b>Applied Year 2 Chapter 2 – Conditional Probability</b><br>w/c 25 <sup>th</sup> January<br>Extending probability, using “given” conditions, two-way tables, Venn diagrams and tree diagrams                             | <ul style="list-style-type: none"> <li>You will be able to understand set notation in probability</li> <li>You will be able to understand conditional probability</li> <li>You will be able to solve conditional probability problems using two-way tables and Venn diagrams</li> <li>You will be able to use probability formulae to solve problems</li> <li>You will be able to solve conditional probability using tree diagrams</li> </ul>                                                                                                                                                                                                                                                                                                                                                      | In class test (~70% skills, ~30% problem solving):<br>w/c 8th February |
| <b>Applied Year 2 Chapter 3 – The Normal distribution</b><br>w/c 22 <sup>nd</sup> February<br>The normal distribution, standardising distributions, finding probabilities, and hypothesis testing for changes             | <ul style="list-style-type: none"> <li>You will be able to understand the normal distribution and the characteristics of a normal distribution curve, <math>X \sim N(\mu, \sigma^2)</math></li> <li>You will be able to find percentage points on a standard normal curve, <math>Y \sim N(0, 1^2)</math></li> <li>You will be able to calculate values on a standard normal curve</li> <li>You will be able to find unknown means and/or standard deviations for a normal distribution</li> <li>You will be able to approximate a binomial distribution using a normal distribution</li> <li>You will be able to select appropriate distributions and solve real-life problems in context</li> <li>You will be able to carry out a hypothesis test for the mean of a normal distribution</li> </ul> | In class test (~70% skills, ~30% problem solving):<br>w/c 8th March    |
| <b>Applied Year 2 Chapter 8 – Further Kinematics</b><br>w/c 22 <sup>nd</sup> March<br>Displacement, Velocity and Acceleration as more complex functions of time when acceleration is not constant, application to vectors | <ul style="list-style-type: none"> <li>You will be able to work with vectors for displacement, velocity and acceleration when using the vector equations of motion</li> <li>You will be able to use calculus with more complex functions of time involving variable acceleration</li> <li>You will be able to differentiate and integrate vectors with respect to time</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                   | In class test (~70% skills, ~30% problem solving):<br>w/c 12th April   |