A LEVEL MATHEMATICS AND FURTHER MATHEMATICS

Examination Board Specification: Edexcel 9MA0 and Edexcel 9FM0

Why Study Mathematics?: For any student who shows a keen interest and a strong understanding of Mathematics, Mathematics and Further Mathematics would make an excellent choice. Students studying Further Mathematics will get to experience one of the true beauties of the subject; the relationships between all aspects of Mathematics. **Students who opt to take Mathematics and Further Mathematics A Level will focus on completing the majority of Maths A Level topics in Year 12 which allow students to access the Further Maths content with greater depth in Year 13.**

Content and Assessment of the Course:

Year 12 and 13 content			
A Level Mathematics			
Topic 1	**Pure Mathematics 1**	**120 minute examination**	**33⅓%**
Students will be learning: Proof; Algebra and Functions; Coordinate Geometry in the (*x,y*) plane; Sequences and Series; Trigonometry; Exponentials and Logarithms; Differentiation; Integration and Vectors.			
Topic 2	**Pure Mathematics 2**	**120 minute examination**	**33⅓%**
This unit expands on the work done in Pure Mathematics 1, taking the topics learned previously and expanding upon them. Students will be learning: Proof; Algebra and Functions; Coordinate Geometry in the *(x,y)* plane; Sequences and Series; Trigonometry; Differentiation; Integration and Numerical Methods.			
Topic 3	**Statistics and Mechanics (Applied Mathematics)**	**120 minute examination**	**33⅓%**
In Statistics students will be learning about Statistical sampling, Data presentation and Interpretation, Probability, Statistical Distributions and Statistical Hypothesis testing. In Mechanics students will be learning about Quantities and units in Mechanics, Kinematics, Forces and Newton's laws and Moments. This unit is split in to two sections (Statistics and then Mechanics) and half the marks are awarded for each section.			
A Level Further Mathematics			
Paper 1	**Core Pure Mathematics 1**	**90 minute examination**	**25%**
This unit includes further exploration of proofs, including proof by induction and contradiction. Alongside this, complex numbers will be introduced. Students will study 2x2 and 3x3 matrices, including both theoretical manipulations and contextual implications of their use. Alongside these new topics, previous topics will be extended, including algebraic manipulation and calculus. Finally, Vectors will be reconsidered and expanded upon.			
Paper 2	**Core Pure Mathematics 2**	**90 minute examination**	**25%**
This unit includes further study of complex number. Alongside this, students will study algebra and functions in more depth, looking at series summations and Maclaurin expansions. Students will also study more Calculus and Polar coordinates. Furthermore, they will study hyperbolic functions and differential equations, applying their integrating and differentiating skills through equations.			
Paper 3	**Further Pure Mathematics 1**	**90 minute examination**	**25%**
This is the first of the optional units, and here students will study Calculus further, looking at Taylor series and considering limits, including Leibnitz's theorem and L'Hopital's rule. Alongside this they will expand on their recent study of differential equations by using the Taylor series for find series solutions. Students will also study equations of parabola, hyperbola and ellipses, studying the conic sections and their properties in depth. They will expand upon their knowledge of vectors from the A level course. Finally they will look at inequalities, and encounter new methods to solve these inequalities.			
Paper 4	**Further Mechanics 1/Further Statistics 1/Decision Maths**	**90 minute examination**	**25%**
The final module is dependent upon student numbers. We will endeavour to place students in a class that complements their remaining A Levels, e.g. Physics students will be studying Further Mechanics, Economists will look at Further Statistics and Computer Scientists will take Decision Maths. Students will take the work they are doing in their Applied module from A level Mathematics and extend it further.			

In Year 12, students will have 20 lessons per fortnight, comprised of 10 lessons for Pure A Level content (split between two teachers), 6 lessons of Applied Mathematics and 4 lessons of Core Pure 1 Further Mathematics content.

Additional Information: WHSB usually also offer the following enrichment for Sixth Form Mathematicians: STEP/MAT club, UKMT Senior Mathematics Challenge, UKMT Senior Team Challenge, talks from visiting mathematicians, visits to Universities for Mathematics lectures and the Mathematical Olympiad/Competition for Girls.

Students also have the opportunity to be involved with the wider Mathematics Enrichment of the school to aid younger Mathematicians. This includes becoming a Maths Prefect, mentoring and supporting students in younger years with their maths and running extra-curricular clubs. These clubs and activities are very popular with many students. Clubs that have been run in the past are the Mathematics Society and Countdown Club. Students also create displays and Mathematics based assemblies to celebrate Maths Events such as Global Maths Week or Pi Day.

Entrance Requirements:

1. GCSE grade 9 in Mathematics, or
2. GCSE grade 8 in Mathematics and a grade 7 in an additional mathematics qualification such as GCSE Statistics or a Level 2 Certificate in Further Mathematics, or
3. GCSE grade 8 in Mathematics and a passing grade in a school-based assessment.