Further Maths GCSE

Year 11

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

Overview	The purpose of the Further Maths curriculum is to equip students with uniquely powerful ways to describe, analyse and solve problems and to make them more prepared for further study of Maths at A Level. We do this by providing a secure understanding of mathematical concepts, concentrating on the complex topics that combine several areas of study into a single question. We concentrate on retention of knowledge and depth of learning. In doing this, all our students have the opportunity to master key skills that will be required in their future development. The content prepares students thoroughly for A Level Maths.

Autumn Term

Half Term 1	Half Term 2	Assessment
■ Number ■ Understand and use the correct hierarchy of operations. ■ Understand and use decimals, fractions and percentages. ■ Understand rounding and give answers to an appropriate degree of accuracy. ■ 2.1: The basic processes of algebra ■ 2.14: Solution of linear equations ■ 1.1: Number ■ Understand and use ratio and proportion. ■ Understand and use decimals, fractions and percentages. ■ 2.6: Expanding brackets and collecting like terms ■ 2.7: Expand for positive integer ■ 1.3: Manipulation of surds, including rationalising the denominator ■ The product rule for counting ■ 2.8: Factorising ■ 2.10: Use and manipulation of formulae ■ 2.9: Manipulation of rational expressions: ■ Use of for algebraic fractions with denominators being numeric, linear or quadratic ■ 2.12: Completing the square	■ 2.2: Definition of a function ■ 2.3: Domain and range of a function ■ 2.4: Composite functions ■ 2.13: Drawing and sketching of functions. Interpretation of graphs. ■ 3.1: Know and use the definition of a gradient ■ 3.6: Draw a straight line from given information ■ 3.5: The equation of a straight line and and other forms ■ 2.13: Drawing and sketching of functions. Interpretation of graphs. ■ 2.5: Inverse functions ■ Learning Outcomes ■ 2.13: Drawing and sketching of functions. Interpretation of graphs.	At the end of HT2 beginning of HT3 we have a formal Mock

Spring Term

Half Term 3	Half Term 4	Assessment
■ 2.14: Solution of quadratic equations ■ 2.15: Algebraic and graphical solution of simultaneous equations in two unknowns, where the equations could both be linear or one linear and one second order	■ 3.2: Know the relationship between the gradients of parallel and perpendicular lines ■ 3.3: Use Pythagoras' theorem to calculate the distance between two points	**Half Term 4** Just before Easter Break. We do United Learning Mock 2 (this consists of 3 papers.

Spring Term	■ 2.11: Use of the factor theorem for rational values of the variable for polynomials ■ 2.17: Solution of linear inequalities ■ 2.17: Solution of quadratic inequalities ■ 2.18: Index laws, including fractional and negative indices and the solution of equations ■ Learning Outcomes ■ 2.19: Algebraic proof ■ 2.20: Using th terms of sequences ■ 2.21: th terms of linear sequences ■ 2.22: th terms of quadratic sequences ■ 2.20: Limiting value of a sequence as ■ 2.16: Algebraic solution of linear equations in three unknowns	■ 3.4: Use ratio to find the coordinates of a point on a line given the coordinates of two other points ■ 3.5: The equation of a straight line and and other forms ■ 3.2: Know the relationship between the gradients of parallel and perpendicular lines ■ 2.15: Algebraic and graphical solution of simultaneous equations in two unknowns, where the equations could both be linear ■ 3.4: Use ratio to find the coordinates of a point on a line given the coordinates of two other points ■ 3.7: Understand that ■ is the equation of a circle with centre and radius ■ 3.8: Understand that ■ is the equation of a circle with centre and radius ■ 6.1: Geometry – circle theorems ■ 3.9: The equation of a tangent at a point on a circle ■ 6.1: Geometry – area & volume ■ 6.4: Use of Pythagoras' theorem in 2D ■ 6.1: Geometry – angle properties ■ 6.1: Geometry – circle theorems ■ 6.2: Understand and construct geometrical proofs using formal arguments ■ 6.7: Be able to use the definitions, and, for any positive angle up to 360° (measured in degrees only) ■ 6.8: Knowledge and use of 30°, 60°, 90° triangles and 45°, 45°, 90° triangles ■ 6.6: Sketch and use graphs of , and for angles of any size ■ 6.10: Solution of simple trigonometric equations in given intervals ■ 6.9: Know and use Trig identities	

	Half Term 5	**Half Term 6**	**Assessment**
Summer Term	■ 6.3: Area of a triangle ■ 6.3: Sine and cosine rules in scalene triangles ■ 6.4: Use of Pythagoras' theorem in 2D and 3D ■ 6.5: Be able to apply trigonometry and Pythagoras' theorem to 2 and 3 dimensional problems		In Year 11 we do a past paper assessment every fortnight, these are a mix of seen and unseen papers.

Summer Term	■ Learning Outcomes ■ 4.1: Know that the gradient function gives the gradient of the curve and measures the rate of change of with respect to ■ 4.3: Differentiation of where is an integer, and the sum of such functions ■ 4.2: Know that the gradient of a function is the gradient of the tangent at that point ■ 4.4: The equation of a tangent and normal at any point on a curve ■ 4.5: Increasing and decreasing functions ■ 4.6: Understand and use the notation ■ 4.7: Use of differentiation to find maxima and minima points on a curve ■ 4.8: Using calculus to find maxima and minima in simple problems ■ 4.9: Sketch/interpret a curve with known maximum and minimum points ■ 5.1: Multiplication of matrices ■ 5.2: The identity matrix I ■ 5.3: Transformations of the unit square in the - plane ■ 5.4: Combinations of transformations		

Useful Resources for Supporting Your Child at Home:	**Homework:**
https://padlet.com/andrewharrison6/ks4-student-resources-e799bycdpno4nmmb	Homework set weekly on MEI Integral