Subject Curriculum Overview for Academic Year 2022/2023

Subject: Mathematics	Subject Leader: Mr S Card	Year 11 Stage B	AUTUMN TERM
Topic	**Key Learning Points**	**Key Vocabulary**	**Assessments**
Block 1 – Probability	• Understand the notation associated with conditional probability • Solve conditional probability problems using two-way tables • Solve conditional probability questions using Venn diagrams • Solve conditional probability problems using tree diagrams • Know the formula for conditional probability • Apply the conditional probability formula to solve problems	Notation Conditional Exhaustive Independent/ dependent	Blocks 1-2 will be assessed before the Autumn half term holiday
Block 2 – Quadratics and completing the square	• Understand the meaning of 'completing the square' • Express quadratics in the form $x^2 + bx + c$ in completed square form • Solve quadratics equations $x^2 + bx + c = 0$ by completing the square • Solve quadratic functions requiring rearranging by completing the square • Find roots of quadratic functions by completing the square • Find the vertex of a quadratic graph by writing it in completed square form	Complete the square Quadratic equation Root Vertex	
Block 3 – Rational and irrational numbers	• Understand the definition of rational and irrational numbers • Write recurring decimals as fraction and vice versa • Simplify surds • Add and subtract surds • Multiply and divide surds • Rationalise surds	Rational number Irrational number Surd	Blocks 3-4 will be assessed before the Christmas holiday
November mock exams	• Preparation for mock exams including learning of key knowledge and formulae • Students sit a full set of GCSE paper at higher level • Feedback and evaluation		
Block 4 – Circle theorems	• Know and use the fact that the angle subtended by the diameter is 90^o • Know and use the fact that the angle at the centre is twice the angle at the circumference • Know and use the fact that angles subtended from the same chord are equal • Understand the term cyclic quadrilateral and how its angles are related • Know and use the fact that the angle between a radius and tangent is a 90^o • Know and use the alternate segment theorem to solve geometry problems	Subtended Chord Cyclic quadrilateral Tangent Segment	

Subject Curriculum Overview for Academic Year 2022/2023

Subject: Mathematics	Subject Leader: Mr S Card	Year 11 Stage B	SPRING TERM
Topic	**Key Learning Points**	**Key Vocabulary**	**Assessments**
Block 5 – Quadratics and identities	• Factorise quadratic expressions of the form $ax^2 + bx + c$ where a is prime • Factorise quadratic expressions where a is a composite number • Solve quadratic equations of the form $ax^2 + bx + c = 0$ by factorising • Solve quadratic equations requiring rearranging by factorising • Expand triple brackets • Solve identity problems involving quadratics	Coefficient Identity Factorise Composite	Blocks 5-6 will be assessed before the Spring half term holiday
Block 6 – 3D coordinates, Pythagoras and trigonometry	• Use Pythagoras' theorem to find missing lengths in cuboids • Use Pythagoras' theorem to find missing lengths in prisms and pyramids • Use trigonometry to find angles between sides and diagonals in cuboids • Use trigonometry to find angles between sides and diagonals other 3D solids • Read 3-dimensional Cartesian coordinates • Solve geometry problems in a 3-dimensional cartesian axis	Pythagoras Trigonometry Hypotenuse Adjacent Opposite Cartesian	
Mock exams	• Preparation for mock exams including learning of key knowledge and formulae • Students sit a full set of GCSE paper at higher level • Feedback and evaluation		
Block 7 – Graphs of motion and kinematics	• Understand the difference between distance and displacement • Draw displacement/time graphs and calculate speeds from them • Understand the difference between speed and velocity • Draw speed/time and velocity/time graphs • Calculate distances and displacement from velocity/time graphs • Use the constant acceleration formulae to solve problems	Displacement Kinematic Velocity Acceleration	
Block 8 – Sine rule, cosine rule and the area of a triangle	• Know and use the area of triangle formula • Find missing sides and angles when given an area • Use the sine rule to find missing sides in non-right-angled triangles • Use the sine rule to find missing angles in non-right-angled triangles • Use the cosine rule to find missing sides in non-right-angled triangles • Use the cosine rule to find missing angles in non-right-angled triangles	Area Ambiguous Diagonal	

Subject Curriculum Overview for Academic Year 2022/2023

Subject: Mathematics	Subject Leader: Mr S Card	Year 11 Stage B	SUMMER TERM
Topic	**Key Learning Points**	**Key Vocabulary**	**Assessments**
Block 9 – Algebraic fractions and functions	• Simplify algebraic fractions • Add and subtract algebraic fractions by getting a common denominator • Multiply and divide algebraic fractions • Solve equations containing algebraic fractions • Understand function notation and how to substitute values in • Calculate composite functions • Find the inverse of a function	Algebraic fraction Factorise Common denominator Function Composite function Inverse function	
GCSE exam preparation	Using analysis from both recent and November mock exams class teachers of individual classes will identify topics required to study in further detail.		Summer 2023 GCSE exam dates Paper 1 – Non-calculator TBC Paper 2 – Calculator TBC Paper 3 – Calculator TBC

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How parents can support learning in the subject this academic year

At the beginning of each new block of work, students will stick a **Knowledge Checklist** into their orange book. This contains a list of the learning objectives for the block (given above), key vocabulary which has been carefully defined and important facts that the students need to know. Helping students to learn the vocabulary and key knowledge will be hugely beneficial to their progress. The objectives are referenced to a Mathswatch video clip which will explain the work, give examples and practise questions. These can be used for pre-learning to gain an insight into what is coming up, consolidation of understanding or catching up on work missed.

Practice is important so please encourage students to complete homework on a weekly basis, suggest they attend Maths Club (Monday after school) which allows them to work on any aspect of their maths with support from several teachers or develop their interest in other areas of maths. Talking and using maths at home is a great way to link maths to everyday situations, for instance scaling up or down ingredients for a recipe, discussing time or money, estimating costs, looking at best value products in the supermarket, converting between units of measure etc.

Due to the hierarchical structure of Mathematics, it is vital that students catch up on any work missed through absences. If a student is absent they are expected to use their Knowledge Checklist to locate a video clip which will explain the work. Students should copy down the examples and work through the questions given. When they return they will need to copy up the missed notes from another student. If they need support with the work then please encourage them to attend Maths Club where staff will be there to help and support.

Recommended Reading

Humble Pi – A comedy of maths errors – Matt Parker
The man who knew infinity – Robert Kanigel
Flatterland – Ian Stewart
Can you solve my problems – Allex Bellos
The number Mysteries – Marcus du Sautoy
Math with bad drawings: Illuminating the ideas that shape our reality – Ben Orlin

Points to note

Students are expected to bring a scientific calculator to every maths lesson. The model we currently recommend is the Casio Classwiz FX-83GTX-S. This calculator can be purchased through the school via parentpay.