

## **Mathematics – Year 9**

### **Curriculum Intent**

In Year 9, Mathematics consolidates and extends students' understanding of number, algebra and geometry while deliberately bridging the transition from Key Stage 3 to GCSE study. Students encounter more abstract mathematical concepts and develop greater precision in algebraic manipulation, graphical interpretation and geometric reasoning. The curriculum is carefully sequenced to strengthen fluency, deepen reasoning and introduce GCSE-style problem-solving, ensuring students are well prepared for the demands of Key Stage 4.

---

### **What Students Will Study Across the Year**

#### **Autumn Term – Geometry, Similarity and Probability**

Students begin with Pythagoras' theorem, learning to calculate missing side lengths in right-angled triangles and applying this to coordinate geometry and real-life contexts, including three-dimensional problems. This is extended into similarity and congruence, where students use scale factors, ratios and congruency tests to compare shapes and solve increasingly complex geometric problems. Alongside this, students develop their understanding of probability, exploring theoretical and experimental probability, sample spaces, two-way tables, Venn diagrams and tree diagrams.

#### **Autumn and Spring Terms – Sequences and Non-Linear Relationships**

Students investigate number sequences, including arithmetic, geometric, square, cube and triangular sequences. They generate sequences using both term-to-term and position-to-term rules, compare linear and non-linear growth and find  $n$ th term expressions. Fibonacci sequences are introduced to support mathematical curiosity and pattern recognition, strengthening algebraic thinking and reasoning.

#### **Spring Term – Algebraic Manipulation and Trigonometry**

Students extend algebraic skills by expanding and factorising expressions, including double brackets and quadratic expressions. They rearrange formulae, change the subject and apply algebra in contextual problems. In trigonometry, students use sine, cosine and tangent to find missing sides and angles in right-angled triangles, selecting appropriate methods and applying trigonometric ratios in both abstract and real-world contexts.

#### **Spring and Summer Terms – Transformations and Standard Form**

Students revisit and deepen their understanding of geometric transformations, including reflections, rotations, translations and enlargements. They describe transformations precisely, identify invariant points and work with positive, fractional and negative scale factors. This is followed by standard form and indices, where students convert between ordinary numbers and standard form, apply index laws and perform calculations involving very large and very small numbers, with and without calculators.

#### **Summer Term – Graphs, Circles and Quadratics**

Students develop confidence with graphical representations, plotting and interpreting linear, quadratic, cubic, reciprocal and exponential graphs. They explore gradients, intercepts, roots, turning points and intersections, and solve problems using distance–time and conversion graphs. The year concludes with circles (area, circumference and sectors) and factorising and solving quadratic equations, including sketching quadratic graphs and interpreting solutions.

---

### **Assessment and Progression**

Assessment throughout Year 9 includes retrieval practice, problem-solving tasks and formal assessments that reflect GCSE-style questions. By the end of the year, students are confident working with algebraic structures, geometric reasoning and graphical interpretation, and are well prepared to begin GCSE Mathematics in Year 10 with secure foundations and increased mathematical