Further Maths Intent Statement

Inspiration and excellence are at the heart of everything we do. Our main aim is to inspire confidence in our students and stimulate their interest in Mathematics, both within the curriculum and the wider world. We hope that this in turn will spark a love of learning and an improved ability to model and solve problems, applying the Mathematical knowledge gained in lessons to a variety of different circumstances. We believe that this will enable our students, irrespective of background, to flourish and leave BVGS well-equipped for whatever they choose to do in life.

Further Mathematics A-Level Overview

Style of course

Further Mathematics complements the material covered in the A-Level Mathematics course, allowing students to go into greater depth and cover a wider variety of areas of mathematics. It further develops the skills and techniques necessary to manipulate and solve mathematically formulated problems.

The overarching themes are the same as those for A Level Mathematics:

Mathematical argument, language and proof

Mathematical problem solving

Mathematical modelling

Structure of the course

In the lower sixth pupils study both Pure Mathematics and Decision Mathematics. In the upper sixth pupils continue to study Pure Mathematics and also study Further Mechanics.

Core Pure Mathematics Content

Topic 1:	Complex numbers
Topic 2:	Series
Topic 3:	Algebra & functions
Topic 4:	Calculus
Topic 5:	Matrices
Topic 6:	Vectors
Topic 7:	Proof
Topic 8:	Polar coordinates
Topic 9:	Hyperbolic functions
Topic 10:	Differential equations

Decision Mathematics Content

Topic 1:	Introduction to algorithms & graph theory
Topic 2:	Algorithms on graphs (minimum connectors & shortest distance algorithms)
Topic 3:	Algorithms on graphs (route inspection & travelling salesman problems)
Topic 4:	Critical path analysis
Topic 5:	Linear programming

Further Mechanics Content

Topic 1: Momentum & impulse
Topic 2: Work, energy & power
Topic 3: Elastic strings & springs & elastic energy
Topic 4: Elastic collisions in one dimension
Topic 5: Elastic collisions in two dimensions

Structure of the Examination

The examination consists of four papers each 1 hour and 30 minutes long. The first two papers cover the core pure mathematics content. There is then one paper for further mechanics and one paper for decision mathematics. Each papers counts as 25% of the overall qualification. Calculators are allowed for all of the papers. There are three assessment objectives, which are AO1 – using and applying standard techniques (approx.. 50%); AO2 – reason, interpret and communicate mathematically (at least
15%); AO3 – solve problems within mathematics and in other contexts (at least 15%).

Teaching and Learning

In Further Mathematics, pupils are encouraged to ask questions and attempt various mathematical approaches to a variety of different problems, discussing and sharing their ideas with each other. During lessons, pupils have the opportunity to work both independently and together in pairs or groups. Outside of lessons, pupils are encouraged to develop as independent learners by regularly revising and practising extra questions in addition to completing the set homework tasks.