Specialist Mathematics

Year 12 at Walford
Her Way

Stage 2
20 Credits

(This subject must be completed in conjunction with or after Stage 2 Mathematical Methods.)
You will further extend and deepen your mathematical knowledge, skills, and understanding using rigorous mathematical algebraic arguments and proofs, and using mathematical models. Applications are set in both real-world contexts and also abstract contexts involving complex numbers, vectors, functions, parametric curves and calculus.

Engage
Skills

Stage 2 Specialist Mathematics extends students' mathematical experience and their mathematical flexibility and versatility, in particular, in the areas of complex numbers and vectors. The general theory of functions, differential equations, and dynamic systems provides opportunities to analyse the consequences of more complex laws of interaction. Problems considered include forming algebraic conjectures and their proof.
Students find solutions to mathematical problems that may:

- be routine, complex, analytical, and/or interpretative
- be posed in a variety of familiar and new contexts
- require discerning use of electronic technology.

Extend
Knowledge

The following curriculum topics are studied (not necessarily studied in this order):
Topic 1: Mathematical induction
Topic 2: Complex numbers
Topic 3: Functions and sketching graphs
Topic 4: Vectors in three dimensions
Topic 5: Integration techniques and applications
Topic 6: Rates of change and differential equations.

Enrich
Experiences

Students are encouraged to participate in Senior Level Mathematics competitions including:

- The Hamann School Mathematics Competition (HSMC), from The Mathematical Association of South Australia (MASA)
- The Computational and Algorithmic Thinking Competition (CAT), from the Australian Mathematics Trust (AMT)
- The Australian Mathematics Competition (AMC), from The Australian Mathematics Trust (AMT)

Assessments/Outcomes

50%: Six Skills and Application Tasks (SATs)
(including the equivalent of one conducted without the use of notes or a graphics calculator);
20%: One Investigation task (up to 15 pages);
30%: SACE 130 minute examination on all topics
(use of a graphics calculator and two double-sided A4 pages of hand-written notes is allowed)

Pathways

Career Pathways: Stage 2 Specialist Mathematics leads to study in a range of tertiary courses such as mathematical sciences, engineering, computer science, and physical sciences. Students envisaging careers in related fields will benefit from studying this subject to further develop analytical, critical thinking and problem-solving skills.
Tertiary options include Engineering (Honours), Engineering double degrees, Mathematical Sciences (Honours), Mathematical Sciences (Advanced), High Performance Computational Physics, plus enhanced preparation for all the options listed below.
Tertiary options from Stage 2 Mathematical Methods include: Applied Data Analytics, Computer Science, Data Science, Dental Surgery, Engineering, Finance and Banking, Mathematical and Computer Sciences, High Performance Computational Physics, Industrial and Applied Mathematics, Mathematical Science, Medical Studies/Medicine, Mineral Geoscience, Science, Secondary School Teaching/Mathematics, Space Science and Astrophysics, Veterinary Bioscience.

Walford