

9. Year 12 Subjects 2011 (Maths)

Specialist Maths Units 3&4

Units 3 AND Unit 4

Areas Of Study:

Specialist Mathematics consists of the following areas of study: 'Functions, relations and graphs' 'Algebra', 'Calculus', 'Vectors' and 'Mechanics'. The development of course content should highlight mathematical structure and proof.

In Unit 3 a study of Specialist Mathematics would typically include content from 'Functions, relations and graphs' and a selection of material from the 'Algebra', 'Calculus' and 'Vectors' areas of study. In Unit 4 this selection would typically consist of the remaining content from the 'Algebra', 'Calculus', and 'Vectors' areas of study and the content from the 'Mechanics' area of study.

Students are expected to be able to apply techniques, routines and processes, involving rational, real and complex arithmetic, algebraic manipulation, diagrams and geometric constructions, solving equations, graph sketching, differentiation and integration related to the areas of study, as applicable, both with and without the use of technology. The appropriate use of technology to support and develop the teaching and learning of mathematics is to be incorporated throughout the units.

Enrolment in Specialist Mathematics Units 3 and 4 assumes a current enrolment in, or previous completion of, Mathematical Methods Unit 3 and 4 and completion of General Mathematics A (Academic Strand) Units 1 & 2.

Assessment:

Both Units 3 and 4 consist of 3 outcomes:

- Outcome 1 - Students should be able to define and explain key concepts as specified in the content from the areas of study, and apply a range of related mathematical routines and procedures.
- Outcome 1 - Students should be able to define and explain key terms and concepts as specified in the content from the areas of study, and apply a range of related mathematical routines and procedures. It is expected that students will be able to use technology as applicable in the solution of problems, as well as apply routines and procedures by hand.
- Outcome 2 - Students should be able to apply mathematical processes, with an emphasis on general cases, in non-routine, contexts and analyse and discuss these applications of mathematics.
- Outcome 3 - Students should be able to select and appropriately use technology to develop mathematical ideas, produce results and carry out analysis in situations requiring problem-solving, modelling or investigative techniques or approaches.

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Specialist Maths Units 3&4 (Cont...)

Assessment Break-Down:

Demonstration of achievement of Outcomes 1, 2 and 3 will be based on the student's performance on a selection of assessment tasks as follows:

- Two analysis tasks will be conducted, with the three outcomes assessed across the two analysis tasks. Each analysis task is a short item of 2–4 hours duration over 1–2 days, selected from:
 - an assignment where students have the opportunity to work on a broader range of problems in a given context; or
 - a short and focused investigation, challenging problem or modelling task; or
 - a set of application questions requiring extended response analysis in relation to a particular topic or topics; or
 - item response analysis for a collection of multiple choice questions, including analysis of item distractors and their relationship to conceptual, process or reasoning error.
- The two analysis tasks will be of a different types.

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Specialist Maths Units 3&4 (Cont...)

Graded Assessment

The Victorian Curriculum and Assessment Authority will supervise the assessment of all students undertaking Units 3 and 4. In Mathematics: Specialist Mathematics the student's level of achievement will be determined by school-assessed coursework and two end-of-year examinations. Percentage contributions to the study score in Mathematics are as follows:

- Unit 3 school-assessed coursework: 14%
- Unit 4 school-assessed coursework: 20%
- Units 3 and 4 examination 1: 22% (*technology free examination*)
- Units 3 and 4 examination 2: 44% (*technology examination*)

Other Information

- Specialist Maths does NOT have a mid-year Exam, but a Practice Exam is held during the third week of the July term break. Other practice exams are also held during Semester Two. It is important that students take every opportunity to ready themselves for the final examination.
- In Specialist Maths (Units 3 and 4) the use of the TI-Nspire CAS calculator is the main mode for satisfying Learning Outcome 3 (Use of technology). As a result it is compulsory for students undertaking any of these units to purchase or retain their CAS calculator.
- Students intending to undertake Specialist Maths at Year 12 (Units 3 and 4) level must undertake Maths Methods at Year 11 (Units 1 and 2) level.
- The Mathematics courses at Year 12 may form pre-requisites for entry into a range of tertiary courses. It is HIGHLY RECOMMENDED THAT ADVICE IS OBTAINED FROM THE CAREERS COUNSELLOR AND YOUR TEACHER BEFORE SELECTION.
- The following pre-requisites apply for VCE Mathematics Units offered at Alphington Grammar School:

Subject	Units	Pre-requisites
Specialist Maths	Units 3 & 4	A unit average of 65% in Year 11 Maths Methods (Semester One result). Semester Two results will also be looked at.

Entry – Units 3 and 4

Except in exceptional circumstances students must complete both Units 1 and 2 of Maths Methods prior to attempting to complete the Unit 3 and 4 progression. Students must complete Unit 3 before completing Unit 4. The school does not encourage students taking Units 3 and 4 Specialist Maths in Year 11.