



## Mathematics, Extension

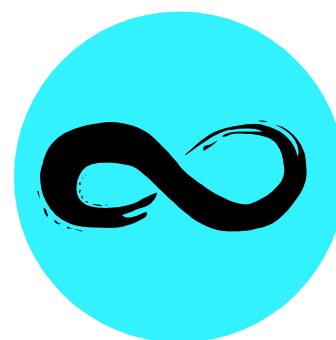
STAGE 6 PRELIMINARY ~ COURSE OUTLINE

The content of this course and its depth of treatment indicate that it is intended for students who have demonstrated a mastery of the skills of Stage 5 Mathematics and are interested in the study of further skills and ideas in mathematics. The course is intended to give these students a thorough understanding of and competence in aspects of mathematics, including many which are applicable to the real world. It has general educational merit and is also useful for concurrent studies of science, industrial arts and commerce. The course is a recommended minimum basis for further studies in mathematics as a major discipline at a tertiary level and for the study of mathematics in support of the physical and engineering sciences. Although the course is sufficient for these purposes, students of outstanding mathematical ability should consider undertaking the Mathematics Extension 2 course.

### MAIN TOPICS COVERED

#### *Preliminary Course*

- Other inequalities
- Further geometry
- Further trigonometry
- Angles between two lines
- Internal and external division of lines into given ratios
- Parametric representation
- Permutations and combinations
- Polynomials
- Harder applications of the Mathematics Preliminary course topics



### SYLLABUS OUTCOMES

*A student ...*

- PE1** appreciates the role of mathematics in the solution of practical problems
- PE2** uses multi-step deductive reasoning in a variety of contexts
- PE3** solves problems involving permutations and combinations, inequalities, polynomials, circle geometry and parametric representations
- PE4** uses the parametric representation together with differentiation to identify geometric properties of parabolas
- PE5** determines derivatives which require the application of more than one rule of differentiation
- PE6** makes comprehensive use of mathematical language, diagrams and notation for communicating in a wide variety of situations

## BOSTES PRELIMINARY ASSESSMENT INFORMATION

Component	Description	Weighting
A. Concepts, skills and techniques	Use of concepts, skills and techniques to solve mathematical problems in a wide range of theoretical and practical contexts	50
B. Reasoning and communication	Application of reasoning and communication in appropriate forms to construct mathematical arguments and proofs and to interpret and use mathematical models	50
		100

## EVIDENCE OF LEARNING (Assessment)

Task No.	Targeted Outcomes	Learning Context	Task	Date Due	Weighting		Marks
					A	B	
1	P 2 – 4	Basic arithmetic algebra and surds, equations and inequations, functions and graphs, geometry.	Assessment Task	Term 1 Week 10	15%	15%	30%
2	P 2 – 5	Trigonometry, linear functions, introduction to calculus, circle geometry	Assessment Task	Term 2 Week 9	15%	15%	30%
3	P 2 – 8	Basic arithmetic algebra and surds, equations and inequations, functions and graphs, geometry, Trigonometry, linear functions, introduction to calculus, circle geometry, quadratic function, locus and parabola, polynomials, permutations and combinations	End of course examination	Term 3 Wks 9-10	20%	20%	40%
<b>TOTAL</b>					<b>50%</b>	<b>50%</b>	<b>100 %</b>

## REPORTING PERFORMANCE AND ACHIEVEMENT IN PRELIMINARY COURSES

The Common Grade Scale shown below is used to report student achievement and performance in the Preliminary Stage 6 year in all NSW schools.

The Common Grade Scale describes performance and achievement at each of five grade levels.

<b>A</b>	The student demonstrates extensive knowledge of content and understanding of course concepts, and applies highly developed skills and processes in a wide variety of contexts. In addition the student demonstrates creative and critical thinking skills using perceptive analysis and evaluation. The student effectively communicates complex ideas and information.
<b>B</b>	The student demonstrates thorough knowledge of content and understanding of course concepts, and applies well-developed skills and processes in a variety of contexts. In addition the student demonstrates creative and critical thinking skills using analysis and evaluation. The student clearly communicates complex ideas and information.
<b>C</b>	The student demonstrates sound knowledge of content and understanding of course concepts, and applies skills and processes in a range of familiar contexts. In addition the student demonstrates skills in selecting and integrating information and communicates relevant ideas in an appropriate manner.
<b>D</b>	The student demonstrates a basic knowledge of content and understanding of course concepts, and applies skills and processes in some familiar contexts. In addition the student demonstrates skills in selecting and using information and communicates ideas in a descriptive manner.
<b>E</b>	The student demonstrates an elementary knowledge of content and understanding of course concepts, and applies some skills and processes with guidance. In addition the student demonstrates elementary skills in recounting information and communicating ideas.