



## Mathematics

### STAGE 6 PRELIMINARY ~ COURSE OUTLINE

The course is intended to give students who have demonstrated general competence in the skills of Stage 5 Mathematics an understanding of and competence in some further aspects of mathematics which are applicable to the real world. It has general educational merit and is also useful for concurrent studies in science and commerce. The course is a sufficient basis for further studies in mathematics as a minor discipline at tertiary level in support of courses such as the life sciences or commerce. Students who require substantial mathematics at a tertiary level, supporting the physical sciences, computer science or engineering, should undertake the Mathematics Extension 1 course or both the Mathematics Extension 1 and Mathematics Extension 2 courses.

#### PRELIMINARY COURSE CONTENT

- Basic arithmetic and algebra
- Real functions
- Trigonometric ratios
- Linear functions
- The quadratic polynomial and the parabola
- Plane geometry – geometrical properties
- Tangent to a curve and derivative of a function



#### SYLLABUS OUTCOMES

*A student ...*

- P1** demonstrates confidence in using mathematics to obtain realistic solutions to problems
- P2** provides reasoning to support conclusions which are appropriate to the context
- P3** performs routine arithmetic and algebraic manipulation involving surds, simple rational expressions and trigonometric identities
- P4** chooses and applies appropriate arithmetic, algebraic, graphical, trigonometric and geometric techniques
- P5** understands the concept of a function and the relationship between a function and its graph
- P6** relates the derivative of a function to the slope of its graph
- P7** determines the derivative of a function through routine application of the rules of differentiation
- P8** understands and uses the language and notation of calculus

## 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	Algebra, numbers and surds, functions and their graphs, graphs and inequations	Assessment Task	Term 1 Week 10	15%	15%	30%
2	P 2 – 5	Trigonometry, co-ordinate geometry, indices and logarithms	Assessment Task	Term 2 Week 9	15%	15%	30%
3	P 2 – 8	Algebra, numbers and surds, functions and their graphs, graphs and in equations, trigonometry, coordinate geometry, indices and logarithms, derivatives, quadratic functions, locus and parabola	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.