

Year 11 Mathematics Advanced and Extension 1 Scope and Sequence Year 11 (2019)

Year 11 Term 1 Mathematics Advanced									
Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
First 3 dotpoints of F1.4 See Note 1 (below)	The topics below may require revision of prerequisite knowledge from Stage 5. MA-F1 Working with Functions <ul style="list-style-type: none"> F1.1 Algebraic techniques F1.2 Introduction to functions F1.3 Linear, quadratic and cubic functions F1.4 Further functions and relations MA11-1, MA11-2, MA11-8, MA11-9						MA-T1 Trigonometry and Measure of Angles <ul style="list-style-type: none"> T1.1 Trigonometry T1.2 Radians MA11-1, MA11-3, MA11-8, MA11-9		
Year 11 Term 1 Mathematics Extension 1									
Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
See Note 2 (below) ME-F2 Polynomials <ul style="list-style-type: none"> F2.1 Remainder and factor theorems F2.2 Sums and products of roots of polynomials ME11-1, ME11-2, ME11-6, ME11-7					ME-F1 Further Work with Functions <ul style="list-style-type: none"> F1.1 Graphical relationships F1.2 Inequalities F1.3 Inverse functions F1.4 Parametric form of a function or relation ME11-1, ME11-2, ME11-6, ME11-7				

Note 1: Begin with Polynomials (the first three dotpoints of F1.4), so that the Extension 1 students may begin Polynomials in Week 1

- Definition of a polynomial
- Identifying the coefficients and degree of a polynomial
- Identifying the shape and features of graphs of polynomial functions of any degree in factored form. Sketching the graphs.

Note 2: Extension 1 Topic A1 (Combinatorics) can be used as a 'time-filler' at any stage during Year 11 Extension 1. It has no prerequisites. It is not a prerequisite for anything other topics. It is scheduled for Year 11 Term 3, but it may be brought forward and used when there are no other topics for which Extension 1 students have the required background.

Year 11 Term 2 Mathematics Advanced									
Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
MA-T2 Trigonometric Functions and Identities MA11-1, MA11-4, MA11-8, MA11-9			See Note 3 (below) MA-C1 Introduction to Differentiation <ul style="list-style-type: none"> • C1.1 Gradients of tangents • C1.2 Difference quotients • C1.3 The derivative function and its graph • C1.4 Calculating with derivatives MA11-1, MA11-5, MA11-8, MA11-9						
Year 11 Term 2 Mathematics Extension 1									
Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
See Note 2 (below) ME-T1 Inverse Trigonometric Functions ME11-1, ME11-3, ME11-6, ME11-7					ME-T2 Further Trigonometric Identities ME11-1, ME11-3, ME11-6, ME11-7				

Note 2: Extension 1 Topic A1 (Combinatorics) can be used as a 'time-filler' at any stage during Year 11 Extension 1. It has no prerequisites. It is not a prerequisite for anything other topics. It is scheduled for Year 11 Term 3, but it may be brought forward and used when there are no other topics for which Extension 1 students have the required background.

Note 3: If time permits, Advanced Topic S1.1 Probability and Venn diagrams could be moved from Term 3 to Term 2. That would allow Advanced Topic S1.2 Discrete probability distributions to be moved from Term 4 to Term 3.

Year 11 Term 3 Mathematics Advanced									
Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
MA-E1 Logarithms and Exponentials <ul style="list-style-type: none"> E1.1 Introducing logarithms E1.2 Logarithmic laws and applications E1.3 The exponential function and natural logarithms E1.4 Graphs and applications of exponential and logarithmic functions Note: Students need to differentiate exponential functions in E1.3 (above) before they start C1.2 (below) in Extension 1. MA11-6, MA11-8, MA11-9					MA-S1 Probability <ul style="list-style-type: none"> S1.1 Probability and Venn diagrams MA11-7, MA11-8, MA11-9		Revision Examinations		

Year 11 Term 3 Mathematics Extension 1									
Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
ME-A1 Working with Combinatorics <ul style="list-style-type: none"> A1.1 Permutations and combinations A1.2 The binomial expansion and Pascal's triangle ME11-5, ME11-6, ME11-7			ME-C1 Rates of Change <ul style="list-style-type: none"> C1.1 Rates of change with respect to time C1.2 Exponential growth and decay C1.3 Related rates of change ME11-1, ME11-4, ME11-6, ME11-7				Revision Examinations		

Year 11 Term 4 Mathematics Advanced									
Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
MA-S1 Probability <ul style="list-style-type: none"> S1.2 Discrete probability distributions MA11-7, MA11-8, MA11-9		Commence Year 12 Advanced							

Year 11 Term 4 Mathematics Extension 1									
Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Commence Year 12 Extension 1									

Year 11 Mathematics Advanced outcomes A student:		Year 11 Mathematics Extension 1 outcomes A student:	
MA11-1	uses algebraic and graphical techniques to solve, and where appropriate, compare alternative solutions to problems	ME11-1	uses algebraic and graphical concepts in the modelling and solving of problems involving functions and their inverses
MA11-2	uses the concepts of functions and relations to model, analyse and solve practical problems	ME11-2	manipulates algebraic expressions and graphical functions to solve problems
MA11-3	uses the concepts and techniques of trigonometry in the solution of equations and problems involving geometric shapes	ME11-3	applies concepts and techniques of inverse trigonometric functions and simplifying expressions involving compound angles in the solution of problems
MA11-4	uses the concepts and techniques of periodic functions in the solutions of trigonometric equations or proof of trigonometric identities		
MA11-5	interprets the meaning of the derivative, determines the derivative of functions and applies these to solve simple practical problems	ME11-4	applies understanding of the concept of a derivative in the solution of problems, including rates of change, exponential growth and decay and related rates of change
MA11-6	manipulates and solves expressions using the logarithmic and index laws, and uses logarithms and exponential functions to solve practical problems		
MA11-7	uses concepts and techniques from probability to present and interpret data and solve problems in a variety of contexts, including the use of probability distributions	ME11-5	uses concepts of permutations and combinations to solve problems involving counting or ordering
MA11-8	uses appropriate technology to investigate, organise, model and interpret information in a range of contexts	ME11-6	uses appropriate technology to investigate, organise and interpret information to solve problems in a range of contexts
MA11-9	provides reasoning to support conclusions which are appropriate to the context	ME11-7	communicates making comprehensive use of mathematical language, notation, diagrams and graphs

Topic Subtopic Subsubtopic			
Y e a r 1 1 A d v a n c e d	Functions	MA-F1 Working with Functions	F1.1 Algebraic techniques F1.2 Introduction to functions F1.3 Linear, quadratic and cubic functions F1.4 Further functions and relations
	Trigonometric Functions	MA-T1 Trigonometry and Measure of Angles MA-T2 Trigonometric Functions and Identities	T1.1 Trigonometry T1.2 Radians
	Calculus	MA-C1 Introduction to Differentiation	C1.1 Gradients of tangents C1.2 Difference quotients C1.3 The derivative function and its graph C1.4 Calculating with derivatives
	Exponential and Logarithmic Functions	MA-E1 Logarithms and Exponentials	E1.1 Introducing logarithms E1.2 Logarithmic laws and applications E1.3 The exponential function and natural logarithms E1.4 Graphs and applications of exponential and logarithmic functions
	Statistical Analysis	MA-S1 Probability and Discrete Probability Distributions	S1.1 Probability and Venn diagrams S1.2 Discrete probability distributions
Topic Subtopic Subsubtopic			
Y e a r 1 1 E x t e n s i o n	Functions	ME-F1 Further Work with Functions ME-F2 Polynomials	F1.1 Graphical relationships F1.2 Inequalities F1.3 Inverse functions F1.4 Parametric form of a function or relation F2.1 Remainder and factor theorems F2.2 Sums and products of roots of polynomials
	Trigonometric Functions	ME-T1 Inverse Trigonometric Functions ME-T2 Further Trigonometric Identities	
	Calculus	ME-C1 Rates of Change	C1.1 Rates of change with respect to time C1.2 Exponential growth and decay C1.3 Related rates of change
	Combinatorics	ME-A1 Working with Combinatorics	A1.1 Permutations and combinations
			A1.2 The binomial expansion and Pascal's triangle

