

# SAMPLE SCOPE & SEQUENCE

## Mathematics Methods, LEVEL 4

### Learning Design

Below is a possible sequence of content for Mathematics Methods MTM415117.

This is an example only; to be used to support teachers to develop their own scope and sequence documents and associated assessment matrices that meet the learning needs of their learners.

**NOTE:** This course may have been amended since the development of this sample teacher resource in 2018. Please visit the [TASC website](http://www.tasc.edu.au) for current version of the course.

### Term 1

Week	Unit and Topic	Subtopic	Criteria Addressed	Criteria Assessed
1	Unit 1, Function Study Topic 1 Polynomial Functions	1.1.1 Binomial Theorem (Appendix A) 1.1.2 Polynomials; factorisation and division of polynomials (Ex 4C, 4D)	C1, C2, C3, C4	
2		1.1.3 Linear equations review (Ex 2C-eqns only & 2F) and worksheets <ul style="list-style-type: none"> <li>Identifying and describing relations &amp; functions (Ex 1B)</li> </ul> 1.1.4 Quadratic functions review (Ex 4A, 4B) 1.1.5 Cubic functions review (Ex 4E)	C1, C2, C3, C4	Assignment 1 (C1, C3, C4)
3	Unit 1 Topic 2 Hyperbola, truncus and square root functions	1.2.1 Hyperbola (1/2 Ex 4A) Cambridge 1/2 1.2.2 Truncus (1/2 Ex 4B) 1.2.3 Square root function (1/2 Ex 4C) 1.2.4 Composite functions (Ex 1D, 1E)	C1, C2, C3, C4	Assignment 2 (C1, C3, C4)

Week	Unit and Topic	Subtopic	Criteria Addressed	Criteria Assessed
4	Unit 1 Topic 3 Exponential & Logarithmic functions	1.2.5 Maths relay and if needed, extra work on Transformations (Ex 3A, 3B, 3C, 3D, 3F, 3G) 1.3.1 Exponential equations (Ex 5C) 1.3.2 Logarithms (Ex 5D, 5B)	C1, C2, C3, C4	
5		1.3.3 Exponential functions (Ex 5A, 5B)	C1, C2, C3, C4	Asst 3 (C1, C3, C4)
		Review and Progress Test 1 WORK FROM TOPICS 1 and 2	C1, 2, 3, 4	C1, 2, 3, 4
6		1.3.4 Graphs of log functions (Ex 5E, 5F)	C1, C2, C3, C4,	
7		1.3.6 Applications of Exponential and log functions (Ex 5I) 1.3.7 Inverse functions (Ex 1F & 7B)	C1, C2, C3, C4	Asst 4 (C1, C2, C3, C4)
8		Revision and test Test 2 on Unit 1	C1, C2, C3, C4	Test 2(C1, C2, C3, C4)
9	UNIT 2 Circular (Trig) functions	2.1 Radians and degrees (Ex 6A) 2.2 Unit circle definitions of sine, cos and tan (Ex 6B) 2.3 Symmetry properties (Ex 6B and 6C)	C1, C2, C3, C5	
10		2.4 Sine and cosine graphs (6D) Desmos investigation (C2, 3) 2.5 Solving trig equations, $\sin x = a$ , $\cos x = a$ and $\tan x = a$ (Ex 6E)	C1, C2, C3, C5	Asst 5 (C1, 2, 3, 5)
Break				
Break				

## Term 2



Week	Unit and Topic	Subtopic	Criteria Addressed	Criteria Assessed
1		2.6 Translating trig graphs – $y = \sin.n(x + b) + c$ & $y = \cos.n(x + b) + c$  (Ex 6F, Ex 6G)  2.7 Find function given trig graph (Ex 6I)	C1, C2, C3, C5	
2		2.8 Tangent graphs (Ex 6J)  2.9 General solution of trig equations (Ex 6K)	C1, C2, C3, C5	Asst 6 (C1, C2, C3, C5)
3		2.10 Applications of circular functions (Ex 6L)  Revision of Unit  TEST 2	C1, C2, C3, C5	TEST 2 (C1, C3, C5)
4	Unit 3 Differential Calculus, Topic 1  Differentiation	3.1.1 Review of Differentiation (Ex 9A)  3.1.2 Rules for differentiation (Ex 9B, 9C)	C1, C2, C3, C4, C5	
5		3.1.3 The chain rule (Ex 9E, Ex 3F)  3.1.4 Derivative of $e^x$ and $\log_e x$ (Ex 9G 7 Ex 9H)	C1, C2, C3, C4, C6	
6		3.1.5 Derivative of $\sin x$ , $\cos x$ and $\tan x$ (Ex 9I)  3.1.6 Product Rule (Ex 9J)  3.1.7 Quotient Rule (Ex 9K)	C1, C2, C3, C4, C6	
7		3.1.8 Graph of the derivative function (Ex 9D)  3.1.9 When is a function differentiable? (Ex 9M)	C1, C2, C3, C4, C6	Asst 7 (C1, C2, C3, C6)
8		3.1.10 Maths relay  Note: depending upon time – Curve sketching may need to be left until term 3  3.2.1 Tangents and normals (Ex 10A)  3.2.2 Stationary points (Ex 10C)	C1, C2, C3, C6	
9		REVISION MID YEAR EXAMS	C4, C5, C6	EXAM (C1, C3, C4, C5, C6)

Week	Unit and Topic	Subtopic	Criteria Addressed	Criteria Assessed
10		MID YEAR EXAMS		
Break				
Break				

### Term 3

Week	Unit and Topic	Subtopic	Criteria Addressed	Criteria Assessed
1	Unit 3 Topic 2 Applications of differentiation	EXAM REVIEW  3.2.3 Types of stationary point—change of sign of first derivative (Ex 10D)  3.2.4 Maximum and Minimum Problems (Ex 10E, 10F)	C1, C2, C3, C6	Asst 8 (C1, C2, C3, C6)
2		3.2.5 Construction box challenge (C1, C2)  3.2.6 Rates of change (including velocity and acceleration) (Ex 10B)  3.2.7 Popcorn machine (C1, C2)  3.2.8 Maths relay	C1, C2, C3, C6	TEST (perhaps a week later)  C1, C2, C3, C7
3	UNIT 4 Integral Calculus	4.1 Anti-differentiation: indefinite integrals (Ex 11B & 11C)  4.2 Integration by rule: $\int(ax + b)^n$ , $\int \frac{1}{(ax+b)^n}$ , $\int e^{kx}$ (Ex 11D)  4.3 Integration of $\sin x$ and $\cos x$ (Ex 11G)  & Miscellaneous exercises (Ex 11H)	C1, C2, C3, C7	
4		4.4 Area under a graph The Fundamental Theorem of Calculus and definite integrals (Ex 11E)  4.5 Area under a curve (Ex 11F), (Ex 11H)  4.6 Area between curves (Ex 11I)	C1, C2, C3, C7	Asst 9 (C1, C7)

Week	Unit and Topic	Subtopic	Criteria Addressed	Criteria Assessed
5		4.7 Area of a region between two curves (Ex 11I) 4.7 Applications of Integration- motion (Ex 11J)	C1, C2, C3, C7	
6		Additional Time for catch-up Revision Integral Calculus Test Integral calculus	C1, C2, C3, C7	TEST (C1, C7)
7	Unit 5 Probability Topic 1 Discrete Random variables	5.1.1 Sample spaces and probability review (Ex 13A) 5.1.2 Conditional probability and independence (Ex 13B) 5.1.3 Discrete random variables (Ex 13C) 5.1.4 Expected value (mean), variance & standard deviation (Ex 13D)	C1, C2, C3, C8	
8	Topic 2 Binomial Distribution	5.2.1 Bernoulli sequences and binomial probability distribution (Ex 14A) 5.2.2 Graph, expectation & variance of a binomial distribution (Ex 14B) 5.2.3 Finding the sample size (Ex 14C)	C1, C2, C3, C8	Assignment 10 (C1, C8)
9	Topic 3 Normal distribution	5.3.1 Normal distribution (Ex 16A) (non examinable) 5.3.2 Standardisation and the 68-95-99.7% rule (Ex 16B) 5.3.3 Determining normal probabilities (Ex 16C) 5.3.4 Solving problems using the normal distribution (Ex 16D)	C1, C2, C3, C8	
10	Topic 4 Statistical Inference	5.3.5 Normal approximation to the binomial distribution (Ex 16E) 5.4.1 Populations and samples (Ex 17A)	C1, C2, C3, C8	Asst 11 (C1, C2, C3, C8)
Break				
Break				

## Term 4

Week	Unit and Topic	Subtopic	Criteria Addressed	Criteria Assessed
1		5.4.2 Exact distribution of the sample proportion (Ex 17B) 5.4.3 Approximating distribution of the sample population (Ex 17C) 5.4.4 Confidence intervals (Ex 17D)	C1, C2, C3, C8	
2		Revision of Probability Probability Test	C1, C2, C3	TEST (C1, C2 C3, C8)
3	Revision	Revision Test on probability and integration Issue provisional results (this ensures every criteria has been tested twice)	C1, C2, C3, C7, C8	TEST (C1,C2 C3, C7, C8)
4	Revision	Revision and retesting Note: generally students aim to move up one level (i.e. C to B) by taking best 2 of 3 test results.	All criteria	C5, C6, C7, C8
5		Issue Final internal Results Prepare for final exam	C4, C5, C6, C7, C8	
6	Exams	TASC EXAMS TBC		C4, C5, C6, C7, C8
7	Exams	TASC EXAMS TBC		C4, C5, C6, C7, C8
8				
9				
10				
Break				
Break				