Varsity College
Year 11 Specialist Mathematics 2024

Term 1

Week	Date	Topics	Assessment
1	**22-26 January** **O-Week** **Australia Day PH Fri**	• O Week	
2	**29 Jan-2 Feb**	**Unit 1 Topic 2: Vectors in the plane** Representing vectors in the plane by directed line segments: • Definition of a scalar and vector **Ch. 6A** • Represent vectors in multiple forms **Ch. 6B** • Convert between Cartesian form and polar form **Ch. 6C**	
3	**5-9 February** **Swimming Carnival - Thurs**	• Scalar (dot) product **Ch. 6D** • Parallel and perpendicular vectors **Ch. 6D** • Projections of vectors **Ch. 6E**	
4	**12-16 February**	• Applications of vectors: displacement and velocity **Ch. 6F** • Applications of vectors: relative velocity **Ch. 6G** • Applications of vectors: forces and equilibrium **Ch. 6H**	
5	**19-23 February**	• Applications of vectors: forces and equilibrium (cont.) **Ch. 6H** • Vectors in the Plane Review **Ch. 6I**	
6	**26 Feb-1 Mar** **GC24 - Wednesday**	**Unit 1 Topic 1: Combinatorics** The inclusion-exclusion principle for the union of two sets and three sets: • Addition principle **Ch. 7A, 7I** • Multiplication principle **Ch. 7A** • Permutations (ordered arrangements) and combinations (unordered selections): • Permutations and factorial notation **Ch. 7B**	
7	**4-8 March**	• Permutations - with/without restrictions **Ch. 7C** • Permutations of like objects **Ch. 7D**	
8	**11-15 March**	• Combinations - with/without restrictions **Ch. 7E, 7F** • Circular arrangements (OneNote) • Identities associated with Pascal's triangle **Ch. 7G** • Binomial expansion using Pascal's triangle (OneNote)	
9	**18-22 March** **GC24 - Thursday**	• Permutations and combinations combined **Ch. 7F** • Applications to probability **Ch. 7J** • Pigeon-hole principle **Ch. 7H**	
10	**25-29 March** **Good Friday PH**	**Exam Block**	**No Exam**
School holidays: Friday March 29 - Sunday April 14			

Term 2

Week	Date	Topics	Assessment
1	**15-19 April** Cross Country – Wed	**Unit 1 Topic 3: Introduction to proof** The nature of proof: • Conditional statements and proof terms **Ch. 8A** • Proof by contrapositive **Ch. 8B** Rational and irrational numbers • Express rational numbers as terminating or eventually recurring decimals **(OneNote)** • Proof by contradiction **Ch. 8C**	
2	**22-26 April** GC24 - Tuesday Anzac Day PH - Thurs	Circle properties and their proofs: • Angle properties of circles **Ch. 10A** • Tangents **Ch. 10B**	
3	**29 Apr-3 May**	• Alternate segment theorem **Ch. 10B** • Chords in circles **Ch. 10C**	
4	**6-10 May** Labour Day PH - Mon	• Geometric proofs using vectors **Ch. 9I** • Exam Revision	
5	**13-17 May**	• Exam Revision • EXAM – students withdrawn from lesson 3 class to complete exam	**Unit 1 Exam Wednesday Lessons 3&4**
6	**20-24 May**	**Unit 2 Topic 3: Matrices** Matrix arithmetic: • Matrix notation **Ch. 17A** • Matrix addition/subtraction and scalars **Ch. 17B** • Multiplication of matrices **Ch. 17C**	
7	**27-31 May**	• Identities, inverses and determinants of 2 × 2 matrices **Ch. 17D** • Solve matrix equations (including simultaneous equations with 2 variables) **Ch. 17E**	
8	**3-7 June**	• Inverses and determinants for n × n matrices **Ch. 17F** • Solve matrix equations using technology **Ch. 17G**	
9	**10-14 June** GC24 – Wednesday Exam shutdown - Fri	Transformations in the plane • Translations **(OneNote)** • Rotations, reflections and dilations **Ch. 18B, 18C** • Combined transformations **Ch.18G**	
10	**17-21 June** Athletics Carnival - Thurs	• Complex numbers diagnostic test (refer OneNote)	**PSMT hand out Lesson 1**
School holidays: Saturday June 22 - Sunday July 7			

Term 3

Week	Date	Topics	Assessment
1	**8-12 July**	**Unit 2 Topic 1: Complex numbers 1** Complex numbers: • The set of complex numbers **Ch. 15A** • Addition/subtraction of complex numbers **Ch. 15A** • Multiplication/division of complex numbers **Ch. 15B** The complex plane (the Argand plane): • Geometric representation of complex numbers **Ch. 15C**	**Checkpoint 1**
2	**15-19 July**	Complex arithmetic using polar form: • Multiplication and division in polar form **Ch. 15E** • De Moivre's theorem **Ch. 15F** Roots of equations: • Quadratic equations with complex roots **Ch. 15D** • Linear factors of real quadratic polynomials **Ch. 15D**	**Checkpoint 2**
3	**22-26 July** **GC24 - Thursday**	The basic trigonometric functions: • Sketching trigonometric graphs **Ch. 13D, 13E** • Solving trigonometric equations **Ch. 13C, 13E** Applications of trigonometric functions to model periodic phenomena: • Modelling periodic motion **Ch. 13I**	**Checkpoint 3**
4	**29 Jul- 2 Aug**	The reciprocal trigonometric functions, secant, cosecant and cotangent • Develop reciprocal ratios and graphs **Ch. 13H** • Transform graphs of reciprocal functions **Ch. 13H** Trigonometric identities • Pythagorean identities **Ch. 14A**	**PSMT due** Start of Lesson 2
5	**5-9 August**	• Angle sums and differences **Ch. 14B** • Double angle identities **Ch. 14B** • Identities for products of sines and cosines expressed as sums and differences **Ch. 14D**	
6	**12-16 August** **GC24 Finals – Wed.**	• Convert sums to products **Ch. 14C** • Sketch and solve functions expressed as sums **Ch. 14C** • Multi-angle trigonometric identities	
7	**19-23 August**	Sketching graphs • Absolute value function **Ch. 12A** • Apply the relationship between the graph of f(x) and the graph of the reciprocal **Ch. 12B**	
8	**26-30 August**	• Sketching graphs of rational functions **Ch. 12D**	
9	**2-6 September**	• Review of Unit 2 leading to Unit 2 Exam	
10	**9-13 September**	**Exam Block**	**Unit 2 Exam**
School holidays: Saturday September 14 – Sunday September 29			

Term 4

Week	Date	Topics	Assessment
1	30 Sept – 4 Oct	**Unit 3 Topic 2: Applications of matrices** • Review basic matrix methods including operations, inverses and determinants **Ch. 7A, 7B, 7D** • Dominance and Leslie matrices **Ch. 7F, 7G**	
2	7-11 October King's B'day PH - Monday	**Unit 3 Topic 2: Systems of linear equations** • recognise the general form of a system of linear equations • solve systems of linear equations using matrix algebra; review use of inverse matrix and Gaussian techniques of elimination to solve a system of linear equations • examine the three cases for solutions of systems of equations **Ch. 6A, 6B, 6C,**	**PSMT hand out** Lesson 2
3	14-18 October	• examine the three cases for solutions of systems of equations **Ch. 6A, 6B, 6C**	**Checkpoint 1**
4	21 - 25 October	**Unit 3 Topic 3: Complex numbers 2** • review Cartesian form of a complex number; real & imaginary parts and arithmetic **Ch. 9A, 9B, 9C** • prove the identities involving modulus and argument **Ch. 9D**	**Checkpoint 2**
5	28 Oct – 1 Nov	• prove and use De Moivre's theorem for integral powers **Ch. 9D** • examine the nth roots of unity and of complex numbers including their location in the complex plane **Ch. 9G** • identify subsets of the complex plane determined by straight lines and circles **Ch. 9H**	**Checkpoint 3**
6	4-8 November	**Factorisation of polynomials** • prove and apply the factor theorem and the remainder theorem for polynomials • consider conjugate roots for polynomials with real coefficients • solve polynomial equations to order 4 **Ch. 9F**	**PSMT due** Lesson 2
7	11-15 November	**Unit 3 Topic 1: Proof by mathematical induction** • Revision of proof techniques **Ch. 3A** • Nature of inductive proof • Proof by mathematical induction **Ch. 3B**	
8	18-22 November	**Exam Block**	
School holidays: Saturday November 23 – Monday January 27			