

Tear 12	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
<p>Topic/Theme/ Focus</p>	<p>In this unit students will be introduced to discrete mathematics</p> <p>They will cover fundamental skills such as:</p> <p>Using Algorithms and the language of graphs to minimise distances.</p> <p>Analysing upper and lower bounds for the travelling salesman problem.</p> <p>Looking for the maximum flow through a directed network using the value of a cut.</p> <p>Using activity networks to find a critical path.</p> <p>Analysing and finding optimum strategies for two player zero sum games.</p> <p>Formulating and solving linear programming problems.</p> <p>Using binary operations and modular arithmetic to generate Cayley tables.</p>	<p>In this unit students will learn how to use matrices and complex numbers.</p> <p>They will learn fundamental skills such as:</p> <p>Using matrices in arithmetic.</p> <p>Describing linear transformations using matrices and identifying invariant points and lines.</p> <p>Using inverses matrices in solving systems of linear equations.</p> <p>Understanding and using complex numbers and their conjugates.</p> <p>Working with modulus-argument form and using Argand diagrams.</p>	<p>In this unit students will further their understanding of algebraic technique, different types of functions and curves.</p> <p>They will learn fundamental skills such as:</p> <p>Understanding how the roots of a polynomial relate to its coefficients</p> <p>Solving inequalities involving polynomials of up to degree 4.</p> <p>To sum sequences using standard formulae and the method of differences.</p> <p>Using proof by induction to prove algebraic statements and divisibility.</p> <p>Using Maclaurin series expansions.</p> <p>Using polar coordinates and sketching graphs in polar form.</p> <p>Using the equations of parabolas, ellipses and hyperbolae.</p> <p>Using the definitions and graphs of hyperbolic functions.</p>	<p>In this unit students will discover further uses of calculus.</p> <p>They will learn fundamental skills such as:</p> <p>Calculating the mean value of a function.</p> <p>Finding areas enclosed by curves and lines.</p> <p>Calculating volumes of revolution generated when curves are rotated around the axes.</p>	<p>In this unit students will learn how to use vectors to describe lines and find distances.</p> <p>They will cover fundamental skill such as:</p> <p>Writing the equation of a line in vector form.</p> <p>Deciding if lines in three dimensions intersect or are skew.</p> <p>Calculating the scalar product of vectors and using it to find angles.</p> <p>Finding points of intersection and calculating distances between points and lines.</p>	<p>In this unit students will deepen their understanding of discrete mathematics.</p> <p>They will learn fundamental skills such as:</p> <p>Understanding Kuratowski's theorem for planarity of a graph.</p> <p>Using flow augmentation to increase a flow through a directed network.</p> <p>To use Gantt charts and resource histograms to solve scheduling problems.</p> <p>Using the simplex algorithm to solve three dimensional linear programming problems and zero sum games with three strategies.</p> <p>Recognising and analysing groups and subgroups and identifying isomorphisms.</p>

Key vocabulary	Path Tree Trail Network Optimum Constraint Identity Inverse	Order Inverse Conform Invariant Real Imaginary Modulus Argument	Coefficient Critical Deduce Rational Asymptote Hyperbolic	Mean Rotate Interval Volume Revolution	Intersect Parallel Skew Perpendicular	Planar Subdivision Augment Duration Feasible Variable Axiom
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