Stage 1 Mathematics: **Semester 2 Overview**

**Kathy Keenan**

This program is for a cohort of students intending to continue to Mathematical Methods at Stage 2.

|  |  |  |
| --- | --- | --- |
| Term 3 | **Topic** | Assessment |
| **Weeks 1-4** | **Counting and Statistics*** The product and sum principles
* Permutations
* Factorial Notation
* Combinations
* Binomial Expansions
* The Binomial Theorem
* Statistical Concepts
* Organising and Displaying Data
* Measuring the centre of data
* Measuring the spread of data
* The Normal Distribution
 | **SAT 1 (25%)****Counting and Statistics**Calculator permittedOne side of an A4 page of handwritten notes permitted.60 minutes |
| **Weeks 5-10** | **Introduction to Differential Calculus*** Rates of change
* Instantaneous rates of change
* Finding the slope of the tangent
* The derivative function
* Rules of differentiation
* Tangents and Normals
* Increasing and decreasing functions
* Stationary Points
* Optimisation
* Motion
 | **Investigation****Cake tin optimisation (25%)**Maximum of 8 single-sided A4 pages.Mathematical Investigation report format.**SAT 2 (25%)****Part 1 – first principles and derivatives of polynomials**no calculator or notes30 minutes**Part 2 - Differential Calculus**Calculator permittedOne side of an A4 page of handwritten notes permitted.40 minutes |
| **Term 4****Weeks 1-5** | **Growth and Decay*** Review - Surds
* Review - Indices
* Review - Index Laws
* Review - Scientific Notation
* Rational Indices
* Expanding and factorising
* Exponential Equations
* Exponential Functions
* Growth and Decay
* Natural Exponential (ex)
* Logarithms in base 10
* Logarithms in base a
* Laws of Logarithms
* Natural Logarithm (ln x)
* Solving exponential equations using logarithms
* More Growth and Decay
 | **SAT 3****Growth and Decay**Calculator permittedOne side of an A4 page of handwritten notes permitted.60 minutes |
| **Week 6** | Revision for Exam |  |
| **Week 7** | Tuesday 27th November 2018**Exam on Topics from Semester 2**Calculator permittedThree A4 pages of handwritten notes permitted.90 minutes |  |