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.

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| 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 permitted  One 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 notes  30 minutes  **Part 2 - Differential Calculus**  Calculator permitted  One 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 permitted  One 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 permitted  Three A4 pages of handwritten notes permitted.  90 minutes |  |