Syllabus 9709 GCE A Level Mathematics – Unit 03 (Pure Mathematics 3)

Recommended Prior Knowledge
This unit (along with P1) is a compulsory unit of A Level mathematics. P1 and P3 each have a weighting of 30% of the total assessment. It is strongly recommended that P1 is completed before P3 is started. However, if centres are not entering students for the AS, it is possible to combine some of the topics within P1 and P3 (for example, vectors and the calculus sections).

General Resources
Cambridge University Press has published a series of textbooks created specifically for the CIE syllabus. The recommended book for this course is:
- Pure mathematics 2&3   ISBN 0 521 53012 1

Internet sites
There are a number of appropriate sites covering parts of this syllabus. General sites that can be recommended are:
- AS Guru (www.bbc.co.uk/education/asguru/maths) – an excellent site published by the BBC aimed specifically at students taking AS examinations. The site therefore provides revision material for unit P1, for use ahead of and during the study of unit P3.
- Autograph - Graph Plotter (www.chartwellyorke.com/autograph.html). A revolutionary aid to the teaching of calculus and coordinate geometry.
- www.mathsrevision.net/alevel

SECTIONS

1	**Algebra** (Topics 1, 2 and 6). The modulus function, polynomial functions of degree 3 or 4, logarithmic and exponential functions and the solution of equations involving these functions (Topics 1 and 2). Solving equations by iterative methods, starting with easy examples such as the solution of a cubic equation (Topic 6). Use of partial fractions and the extension of the binomial expansion in Unit P1 to include n rational (Topic 1). Approximately 30% of the assessment for the Unit.
2	**Calculus** (Topics 4, 5 and 8). The differentiation and integration of simple trigonometric, exponential, logarithmic and composite functions. Differentiation of products, quotients and functions defined implicitly or parametrically. Integration by partial fractions, by substitution and by parts. The use of the trapezium rule to estimate the value of a definite integral. The solution of differential equations in which the variables are separable completes this unit. Approximately 30% of the assessment for the Unit.
3	**Trigonometry** (Topic 3). The properties and graphs of all six trigonometric functions. The use of addition formulae for double angle identities and for expressing $a\sin\vartheta + b\cos\theta$ as $R\sin(\theta \pm \alpha)$ or $R\cos(\theta \pm \alpha)$. Approximately 15% of the assessment for the Unit.
4	**Vectors and Complex Numbers** (Topics 7 and 9). The work on vectors in P1 is extended to a study of the vector equation of a line and of a plane. These equations are used to solve geometrical problems involving angles, distances, lines and planes. The work on complex numbers looks at the simple algebra of complex numbers, including polar representation and the representation of points, lines and regions by complex equations and inequalities. Approximately 25% of the assessment for the Unit.

Please note that the Sections outlined above are not of equal size. They have been designed to provide coherent topics that will take students through the A Level course in a logical and ordered way. A very approximate weighting is given with each Section.