
Campaign for Real Education

18 Westlands Grove, Stockton Lane, York YO31 1EF. Tel. 01904 424134 or 07775 656608

Vice Chairmen: Yasmin Ahmed, Katie Ivens

Hon. Secretary: Dr Vera Dalley, 12 Pembroke Square, Kensington, London W8 6PA. Tel. 01904 424134

**OBSERVATIONS ON LONDON (EDEXCEL) ‘A’ LEVEL MATHEMATICS
FROM 1960 TO 2004**

In the early 1960s, pure and applied mathematics taken as one ‘A’ level comprised two 3 hour papers, each containing 10 long questions covering the whole syllabus, from which candidates were expected to answer 8.

Since then, the ‘A’ level mathematics syllabus has undergone several changes, the most deleterious following the abolition of the C.S.E. and the ‘O’ level and their replacement with the G.C.S.E. In 1992, modularization created four examination papers (modules) each of which could be taken at separate sittings, 6 months apart if the candidate wished.

Modularization broke the syllabus into smaller, easier to learn (cram) chunks, with some topics in a module never again to be encountered in a later module. This allowed candidates who possessed little, or only short-term, memory to obtain an ‘A’ level in mathematics which they could not have obtained under the old system.

Furthermore, by 1995 almost half of the pure mathematics topics had been removed (Appendix 1). In a study of the performance of first year students in an engineering department, K. L. Todd¹, reported that a student with a grade A in mathematics in 2001, on average obtained a score on his test which would have placed that student near the bottom of the cohort 15 years previously.

Since 1991, D. A. Lawson² has performed a diagnostic test on first year students on degree courses with significant mathematical content. He found that a student with a grade B in ‘A’ level mathematics in 1999 scored similarly to a student with grade N (a fail grade) in 1991.

In these studies by Todd and Lawson, the candidates reviewed had taken their ‘A’ level mathematics with whichever examination board their school had subscribed to, not particularly Edexcel.

The Chief Executive of the Qualifications and Curriculum Authority (QCA) agreed that there had been a “backsliding” of standards during the 1990s and that they would now be “reasserting earlier standards”. To redress the situation, the QCA introduced Curriculum 2000. This applied to all examination boards and for Edexcel a small number of the topics which had been removed previously has been restored to the syllabus (topics 2, 7, 9, 10, 15 & 18 in Appendix 1) but the examination now has 6 modules (or units), involving even less content per examination paper – less to learn per module or per sitting.

The mathematical skills and topics, which previously formed part of the syllabus for children aged 14 to 16 years, and were examined at C.S.E. and ‘O’ level, are now set as questions in the early ‘A’ level units. In particular, finding areas and volumes using calculus, which used to be examined at ‘O’ level, are now examined in ‘A’ level pure mathematics units one (P1) and two (P2) respectively, but it is the ‘O’ level questions which are harder.

Some applied mathematics C.S.E. papers from the 1970s are almost indistinguishable from the mechanics unit one (M1) ‘A’ level paper, with some C.S.E. topics even overlapping with

18. The inverse functions of sine, cosine and tangent, defined over suitable regions and the graphs of these functions.
19. The application of differentiation to small increments and approximations.
20. The integrals of $\frac{1}{1+x^2}$, $\frac{1}{\sqrt{1-x^2}}$.

/June 2004