



## **Stretch and Challenge in level 3 Mathematics February 2010**

### **Introduction**

ACME believes that there is a continuing need for an Advanced Extension Award (AEA)-type qualification in Mathematics, revising and extending the existing AEA in the context of other developments in Level 3 Mathematics. This paper sets out the rationale for ACME's position, together with a preliminary action plan for its implementation.

### **Rationale**

The QCA (as it then was) consultation on Level 3 Mathematics held in the summer of 2009 confirmed that the mathematics community believes that separate assessment, beyond A2 papers, is necessary to provide stretch, challenge and inspiration for the most mathematically able learners, and to act as an effective measure of aptitude to pursue mathematically highly demanding degree courses. Such an extension award does not simply give credit for achievement; but also encourages richer and more rewarding mathematical activity for those who are capable of it and so develops and deepens the mathematics of talented students. For many students, not simply the very best, grappling with more difficult problems will lift achievement to a higher level than that reached by striving for near perfect answers to relatively straightforward questions.

The proposed A\* grade – to be awarded to those achieving over 90% at A2 – will have no value in discriminating between the very best mathematics candidates, given the inevitable focus on accuracy rather than the ability to attempt more challenging questions.

The need for more challenging and inspiring material cannot be met within the confines of A-level Mathematics, but this is not a failing of that qualification. In mathematics any particular examination question is suitable for only a narrow range of candidates; those who fall outside the range are likely to find a question either trivial or impossible. If questions were included in A2 Mathematics papers which would stretch the very best students they would at the same time render the paper unjustly hard for the remainder of the cohort. An extension award, together with Further Mathematics, is a necessary and effective response to the breadth of the cohort.

A nationally available (and funded) extension award should make it feasible to support learners wherever they were studying through arrangements such as the Further Mathematics Support Programme and the use of web-based resources. If there is no publicly funded AEA-type provision there is also a danger of yet further division between examinations taken in the state and private sector.

### **Action**

As an interim measure the AEA in mathematics has exceptionally been allowed to continue until summer 2012, and QCDA has now agreed to extend this further to 2013 because the introduction of the revised GCE A-level will not start until 2012. The qualification fulfils a valuable role and ACME believes it should not be withdrawn until a suitable replacement is available.



The experience gained through the AEA suggests that there would be value in developing an improved replacement which would be aimed at all A-grade GCE Mathematics candidates and had a grading scale which recognised achievement at a broader range of levels than the AEA (which has only two pass grades) and allowed more nuanced use by higher education selectors. It would be synoptic of the core and contain unstructured questions which tested problem-solving and the ability to develop and communicate mathematical arguments in greater depth than does A-level Mathematics.

ACME is happy to lead on this work, which would in the first instance require a working party to be set up with a view to having the revised extension award arrangements ready for students who start the two-year A-level course in September 2012 and take the extension paper in summer 2014. The working party would need experienced practitioners working in schools, colleges and higher education who are aware of the needs of undergraduates in mathematics itself and in the many subjects which make use of mathematics. Linkage with HE here is particularly important given the indications that some universities are considering developing their own entrance examinations to discriminate between the best candidates; a publicly-funded extension qualification would help to mitigate against this.

This review would need to go beyond simply setting up a revised extension award, it would also need to look at its relationship with the Sixth Term Examination Paper (STEP) assessments and the development of the support structures mentioned above.

## **Conclusion**

ACME is happy to lead on bringing together a group with an interest in this area to initiate the development of a revised extension award in mathematics, and to ensure that QCDA receives the expert advice needed to take such a project forward. ACME believes the extension award will enrich and strengthen the mathematics of many able students, and encourage them both to continue to study and mathematics and to apply it effectively.

**ACME**  
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