



**Response from the Mathematical Association
to Ofqual's consultation:**

**Developing new GCSE, A level and AS qualifications
for first teaching in 2016**



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Ofqual/14/5487

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Would you like us to treat your response as confidential?*

If you answer yes, we will not include your details in any list of people or organisations that responded to the consultation.

() Yes No

Is this a personal response or an official response on behalf of your organisation?*

- () Personal response (please answer the question 'If you ticked 'Personal views'...')
- Official response (please answer the question 'Type of responding organisation')

If you ticked "Official response from an organisation/group", please respond accordingly:

Type of responding organisation*

- () Awarding organisation
- () Local authority
- () School or college (please answer the question below)
- () Academy chain
- () Private training provider
- () University or other higher education institution
- () Employer
- Other representative or interest group (please answer the question below)

Type of representative group or interest group

- () Group of awarding organisations
- () Union
- () Employer or business representative group
- (✓) Subject association or learned society
- () Equality organisation or group
- () School, college or teacher representative group
- () Other (please state below)
-

Nation*

- (✓) England
- (✓) Wales
- (✓) Northern Ireland
- (✓) Scotland
- () Other EU country: _____
- () Non-EU country: _____

How did you find out about this consultation?

- (✓) Our newsletter or another one of our communications
- (✓) Our website
- () Internet search
- () Other
-

May we contact you for further information?

- (✓) Yes () No

A level and AS qualifications in mathematics

Consultation Question 33: To what extent do you agree or disagree that AS qualifications in mathematics should be assessed entirely by exam?

- (x) Strongly agree
- () Agree
- () Neither agree nor disagree
- () Disagree
- () Strongly disagree

Please give reasons for your answer.

We feel that the content of the AS qualification can be assessed effectively entirely by exam, although this limits the scope to assess students' handling of large data sets. The content statement about using technology or specialist statistical packages to explore a large data set does not seem to fit completely comfortably with the exam-only model. However, in the interests of more open comparability, it is felt that exam-only assessment is most appropriate here.

Consultation Question 34: To what extent do you agree or disagree that A level mathematics should be assessed entirely by exam?

- () Strongly agree
- (x) Agree
- () Neither agree nor disagree
- () Disagree
- () Strongly disagree

Please give reasons for your answer.

As well as the concern above regarding statistics, there is some regret that the opportunity to assess work on numerical solutions to equations through a more extended, technology-based method will no longer be an option. However, the consensus is that standardising the assessment structure across all A level mathematics specifications is necessary.

Consultation Question 35: To what extent do you agree or disagree that the proposed assessment objectives are appropriate for A level and AS qualifications in mathematics?

- () Strongly agree
- (x) Agree
- () Neither agree nor disagree
- () Disagree
- () Strongly disagree

Please give reasons for your answer.

Although we think that the reduction to three core assessment objectives helps bring more clarity to the objectives, the opportunity to identify some progression in these objectives between AS and A level appears to have been missed.

The increased emphasis on problem solving is welcome, but concern has been expressed that an extensive and comprehensive professional development programme is needed to build up expertise at teaching these complex skills.

The fact AS and A level Mathematics share common assessment objectives also contributes to the grave risk that AS Mathematics will become, or be seen as, overloaded again, as in Curriculum 2000, with the consequent threats to uptake for AS and to progression to A level, which previously led to such acute problems.

Consultation Question 36: To what extent do you agree or disagree that the proposed weightings of the assessment objectives are appropriate for AS qualifications in mathematics?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please give reasons for your answer.

The opportunity to build in some progression from Mathematics to Further Mathematics has been missed by having identical common assessment objectives. Objectives in Further Maths might have been expected to show greater rigour and demand greater sophistication than in Maths.

Consultation Question 37: To what extent do you agree or disagree that the proposed weightings of the assessment objectives are appropriate for A level mathematics?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please give reasons for your answer.

Within the assessment objectives, we note the italic text accompanying both AO2 and AO3 and we recognise that it has been included in order to support the new emphasis on reasoning, interpreting and problem solving. However it does mean that many AO1 marks will be used up in questions addressing AO2 and AO3 and there is a risk that there will therefore be insufficient remaining AO1 marks available to test basic technique on its own (which is certainly still needed). For weaker candidates, AO1 is likely to be the source of many of their marks but if the AO1 marks are hidden behind AO2 and AO3 barriers, then those AO1 marks will not be accessible to the weaker candidates.

It would be good to see accessible AO2 and AO3 questions but we believe that it will prove to be a challenge to set many of them, at least initially. We would therefore advocate a larger allocation of marks for AO1; without that we fear that the resulting

exams may be very difficult and largely inaccessible to the weaker end of the present AS or A level clientele.

Consultation Question 38: Do you have any further comments relating to the assessment of this subject?

We would welcome clarification as to whether the AS material will be examined at A level standard in the final AS examinations.

In terms of the demand and style of the questions to be asked in the new assessments, we would argue that some non-statutory guidance would be highly desirable, both for awarding bodies and for teachers.

We note the words of caution sounded in the letter from Professor Richard Craster on behalf of ALCAB to the DfE (July 2014). Amongst other things it called for a degree of gradualism and it may be sensible to try to have some transition to the new regime in the demands for problem solving and (particularly) and new approach to statistics.

We have some concerns about the timing of the introduction of the new assessment framework, for which teaching will begin in September 2016, BEFORE the new GCSE has run its full course (first assessment Summer 2017). Moreover we are very concerned that the AS specification is over-full, and although we recognise that other subjects are also having added rigour and content, we are concerned about mathematics losing the ground it has gained in recent years in terms of uptake.

We also think that there is, at this time, an important opportunity to look very carefully at the scheduling of the examination period, and consider a return to later assessments. Although we welcome the reduction in disruption which will follow from the move away from modular exams and associated retakes, we still feel that this is an opportune time to move the AS and A level summer examinations firmly into June. The demands on awarding bodies are now considerably reduced with online marking and continual moderation, grading decisions can be made using electronic collection of data and marks themselves are distributed electronically, all freeing up ample time.

A level and AS qualifications in further mathematics

Consultation Question 39: To what extent do you agree or disagree that AS qualifications in further mathematics should be assessed entirely by exam?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please give reasons for your answer.

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Consultation Question 40: To what extent do you agree or disagree that A level further mathematics should be assessed entirely by exam?

- () Strongly agree
- (x) Agree
- () Neither agree nor disagree
- () Disagree
- () Strongly disagree

Please give reasons for your answer.

Some of the topics in Further Mathematics lend themselves to extended investigation in contexts appropriate to students' interests. Whilst good teaching will still allow for this to take place, for example in the study of differential equations, there is some loss of richness in this move to exam-only assessment. In view of the fact that the content of Further Mathematics is not prescribed beyond the 50% core, it seems reasonable to allow awarding bodies the option of alternative assessments, such as projects or coursework, although we feel that Extended Projects or other enrichment might better allow students the opportunity to explore individually some mathematics in greater depth.

Consultation Question 41: To what extent do you agree or disagree that the proposed assessment objectives are appropriate for A level and AS qualifications in further mathematics?

- () Strongly agree
- (x) Agree
- () Neither agree nor disagree
- () Disagree
- () Strongly disagree

Please give reasons for your answer.

As explained in the section responding to the Mathematics AS and A level assessment, we would like to see some progression within these objectives, leading to an emphasis on greater rigour, wider application and greater sophistication of mathematical argument and proof in the more abstract topics within further maths.

Consultation Question 42: To what extent do you agree or disagree that the proposed weightings of the assessment objectives are appropriate for AS qualifications in further mathematics?

- () Strongly agree
- (x) Agree
- () Neither agree nor disagree
- () Disagree
- () Strongly disagree

Please give reasons for your answer.

In both AS and A level Further Mathematics, there is some thought that a greater weighting could be put to AO2, preparing students more directly for the rigour of university studies.

Consultation Question 43: To what extent do you agree or disagree that the proposed weightings of the assessment objectives are appropriate for A level further mathematics?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please give reasons for your answer.

Please see our response to question 42 above.

Consultation Question 44: Do you have any further comments relating to the assessment of this subject?

Comments on the prescribed content, and in particular the proportion of pure mathematics in the AS content, are being made in our submission to the DfE on subject content. We are concerned that only 30% of the AS Further Maths may be pure, when this branch of mathematics is vital to the continued improvement of our national performance in STEM subjects, and AS Further Mathematics should perhaps be providing a wider range of key pure topics and their applications to problem solving.

Equality impact

Consultation Question 72: We have identified a number of ways the proposed requirements for reformed GCSE, A level and AS qualifications may impact (positively or negatively) on persons who share a protected characteristic. Are there any other potential impacts we have not identified?

- Yes
- No

Consultation Question 73: Are there any additional steps we could take to mitigate any negative impact resulting from these proposals on persons who share a protected characteristic?

- Yes
- No

Consultation Question 74: Have you any other comments on the impacts of the proposals on persons who share a protected characteristic?

- Yes
- No