



Advanced Mathematics
Support Programme®

Level 3 maths update 2022-23

This update provides an overview of the level 3 qualifications in maths for university admissions and academic staff. As a result of funding reforms in England, the number of AS/A level subjects taken by a typical sixth form student has reduced from 4 to 3. AS levels have been decoupled from A levels and, alongside funding changes, this has meant that fewer schools and colleges offer students the opportunity to take AS levels in Year 12.

The current specifications for AS/A level Mathematics and Further Mathematics were introduced for first teaching in 2017. The first entries for the level 3 Core Maths qualifications, with equivalent UCAS points to an AS level, were in 2016.

Following The Smith Review of post-16 mathematics¹ the Advanced Mathematics Support Programme² (AMSP) was launched in April 2018. This is a government funded initiative, managed by MEI³, which aims to increase participation in Core Maths, AS/A level Mathematics and Further Mathematics, and improve the teaching of these level 3 maths qualifications.

The AMSP provides information, advice and guidance about developments in level 3 maths to Higher Education Institutions, learned societies and subject organisations



In addition to the Large Programme Uplift⁴, the Government provided additional funding for schools/ colleges to increase the number of students studying level 3 maths qualifications, through the Advanced Maths Premium and the new High Value Courses Premium⁴. The Smith Review called on the Department for Education to "...work with UK learned societies to encourage universities to better signal and recognise the value of level 3 mathematics qualifications for entry to undergraduate courses with a significant quantitative element".

The message was echoed in a joint report by the British Academy and Royal Society⁵ on uptake of core maths whose recommendations include "universities should do more to signal to students the value of mathematics qualifications post-16."

¹ <https://www.gov.uk/government/publications/smith-review-of-post-16-maths-report-and-government-response>

² <https://amsp.org.uk>

³ <http://mei.org.uk>

⁴ <https://amsp.org.uk/leadership/funding>

⁵ <https://royalsociety.org/topics-policy/publications/2022/core-maths-statement/>

Core Maths

Core Maths is an umbrella term for the following four level 3 maths qualifications, which are defined by the government's technical guidance¹

- AQA Level 3 Certificate Mathematical Studies²
- OCR Level 3 Certificate in Core Maths A (MEI)³
- OCR Level 3 Certificate in Core Maths B (MEI)⁴
- Pearson Edexcel Level 3 Certificate in Mathematics in Context⁵

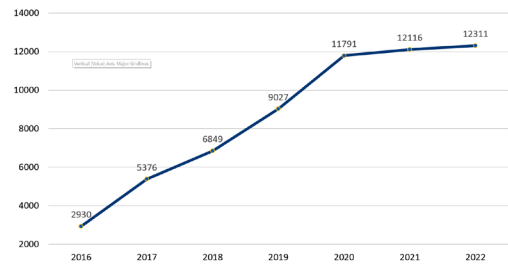
These qualifications are equivalent in size to an AS level qualification and have the same number of UCAS tariff points. All Core Maths qualifications focus on using and applying maths and include ideas and skills that support maths in other courses including A levels and vocational qualifications.

Entries for Core Maths have quadrupled since 2016. In 2022, 12,311 students entered Core Maths, a 36% increase in students sitting a Core Maths exam compared to 2019. The proportion of students taking Core Maths who were female was 47%, similar to 2021.

Why should students study Core Maths?

Core Maths is intended for students who have passed GCSE Mathematics at grade 4 or better, but who have not chosen to study AS or A level Mathematics. Studied in a single year or over a two-year period, it can be taken alongside A levels or other qualifications, including vocational courses.

Core Maths entries 2016-2022
(from awarding organisation results)



Studying Core Maths helps students develop their quantitative and problem-solving skills. This is valuable preparation for many degree courses, particularly in subjects such as geography, psychology, business-related courses, sports and social sciences, and natural science courses that do not require AS/A level Mathematics. Many universities have shown their support for Core Maths; however, relatively few mention it in their admissions requirements which is where it would have the biggest impact on uptake. Recently the universities of Aston, Bath, Sheffield and York have all introduced alternative offers⁶ for a range of degree courses for students with Core Maths qualifications. If Core Maths would be useful preparation for a degree course, please consider including it in your published admissions criteria, perhaps in a similar way to the EPQ where a reduced offer is often made if the EPQ is included in a programme of study.

All Core Maths qualifications include:

- interpreting solutions in the context of the problem
- understanding sources of error and bias when problem-solving
- working with data
- understanding risk and probability
- understanding variation in statistics
- using exponential functions to model growth and decay

Most Core Maths qualifications also include:

- percentage change
- interpretation of graphs
- financial maths
- using standard units
- Fermi estimation
- the Normal distribution
- correlation, knowing it does not imply causation

¹ <https://www.gov.uk/government/publications/core-maths-qualifications-technical-guidance>

² <https://www.aqa.org.uk/subjects/mathematics/aqa-certificate/mathematical-studies-1350>

³ <https://www.ocr.org.uk/qualifications/core-maths/a-mei-level-3-certificate-h868>

⁴ <https://www.ocr.org.uk/qualifications/core-maths/b-mei-level-3-certificate-h869>

⁵ <https://qualifications.pearson.com/en/qualifications/edexcel-mathematics-in-context/mathematics-in-context.html>

⁶ <https://amsp.org.uk/universities/alternative-admissions-offers-level-3-maths>

AS/A level Mathematics

There are 4 specifications for AS/A level Mathematics: AQA¹, Edexcel², OCR A³ and OCR B (MEI)⁴.

The content of AS/A level Mathematics is 100% prescribed and common to all specifications. So, regardless of which specification students have followed, they will have covered the same topics:

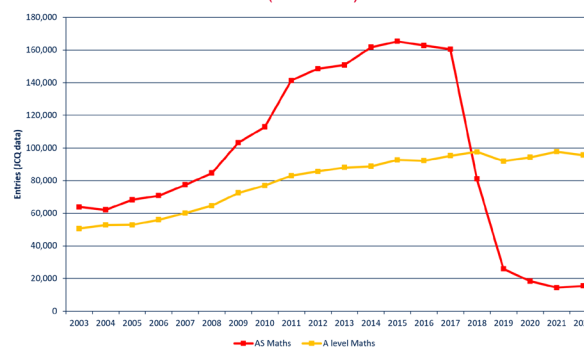
- pure maths (about two thirds of the content)
- statistics (about one sixth of the content).
- mechanics (about one sixth of the content).

Decision/discrete maths is no longer included in AS and A level Mathematics, but it is available as an option in Further Mathematics.

Over the last decade the number of students taking A level Mathematics in the UK has increased.

In 2022, A level Mathematics entries decreased by 2.1% on 2021, following a slight increase in 2020.

A and AS level Mathematics entries in the UK 2003-2022 (JCQ data)



A level Mathematics remains the most popular subject at A level with over 95,000 entries. It is the most popular choice for boys and the fourth most popular choice for girls.

The decoupling of AS and A levels has resulted in roughly a 90% decrease in AS Mathematics entries since 2017.

Whilst disappointing this is a symptom of both the decoupling of AS and A levels and post-16 funding changes and is not peculiar to Maths. The table shows the entries in the UK for AS/A level Mathematics 2022:

Qualification	Entries in 2022	Entries in 2019*	Entries in 2010	% change since 2019	% change since 2010
A level Mathematics	95,635	91,895	77,001	+4%	+24%
AS level Mathematics	15,489	25,923	112,847	-40%	-86%

(data source: JCQ) * 2019 was the first full entry for A level under the new 2017 specifications



¹ <https://www.aqa.org.uk/subjects/mathematics/as-and-a-level/further-mathematics-7367>

² <https://qualifications.pearson.com/en/qualifications/edexcel-a-levels/mathematics-2017.html>

³ <https://www.ocr.org.uk/qualifications/as-a-level-gce/further-mathematics-a-h235-h245-from-2017>

⁴ <https://www.ocr.org.uk/qualifications/as-a-level-gce/further-mathematics-b-mei-h635-h645-from-2017>

AS/A level Further Mathematics

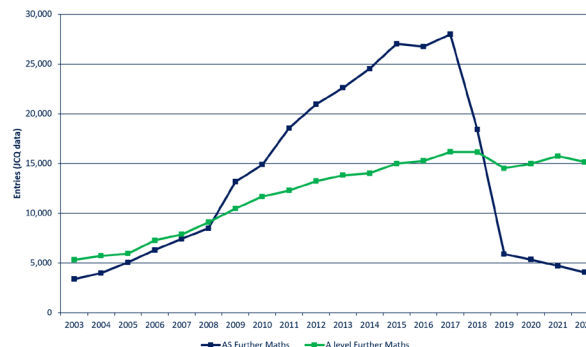
There are 4 specifications for Further Mathematics AQA¹, Edexcel², OCR A³ and OCR B (MEI)⁴.

For A level Further Mathematics 50% of the content is prescribed pure maths content and common to all specifications. Students have some choice over additional applied and pure maths content that is studied depending on the school or colleges' choice of awarding organisation.

Over the last 10 years the number of students taking A level Further Mathematics in the UK has increased. In 2022 15,146 students entered A level Further Mathematics. Of these students, 28% were female. In 2022, A level Further Mathematics entries decreased slightly by 4%. Overall 16% of students who took A level Mathematics also took A level Further Mathematics.

Although AS level entries have decreased since AS was decoupled from A level, the number of students taking AS Further Mathematics relative to the A level entry number is much higher than for other subjects.

A and AS level Further Mathematics entries in the UK 2003-2022 (JCQ data)



The AS qualification covers valuable content that provides good preparation for many STEM degree courses in addition to A level Mathematics. If your course is one of these, please consider including this in your published admissions criteria.

The table below shows the entries in the UK for AS/A level Further Mathematics for 2022.

Qualification	Entries in 2022	Entries in 2019*	Entries in 2010	% change since 2019	% change since 2010
A level Further Mathematics	15,146	14,527	11,682	+4%	+30%
AS level Further Mathematics	4,056	5,898	14,884	-31%	-73%

(data source: JCQ) * 2019 was the first entry for A level Further Mathematics under the new 2017 specifications

Factors supporting increases in participation in level 3 maths:

- More maths teachers, confident and skilled in teaching level 3 maths.** The AMSP provides professional development courses focused on improving subject knowledge and pedagogy to thousands of teachers. These have helped improve the teaching capacity in schools and colleges.
- A level Further Mathematics is more widely available to students in state-funded schools and colleges.** In 2004-05, less than 40% of the state-funded A level Mathematics providers in England had students taking A level Further Mathematics; in 2021-22 this proportion was 73%.
- Promotion of level 3 maths to GCSE students.** The AMSP organises in the region of 200 maths enrichment events per year for 11-16 students. Around 20,000 students from 1000 state-funded schools participate in the events each year. These events inform students about the choices available to them post-16.
- Increasing information, advice and guidance to STEM, social science, business and economics degree courses.** Information provided on university websites and at HE open days encouraging the study of A level Mathematics, Further Mathematics and Core Maths is crucial in convincing students, teachers and school leaders of its importance.

1 <https://www.aqa.org.uk/subjects/mathematics/as-and-a-level/further-mathematics-7367>

2 <https://qualifications.pearson.com/en/qualifications/edexcel-a-levels/mathematics-2017.html>

3 <https://www.ocr.org.uk/qualifications/as-a-level-gce/further-mathematics-a-h235-h245-from-2017>

4 <https://www.ocr.org.uk/qualifications/as-a-level-gce/further-mathematics-b-mei-h635-h645-from-2017>