Statement on Methods of Assessment in the Mathematical Sciences

(Updated June 2025)

Executive Summary

The learned and professional bodies for the mathematical sciences encourage all universities to utilise discipline-specific expertise located within their individual departments to design diverse and balanced assessment portfolios that uphold academic integrity, support fairness, and reflect the full range of mathematical knowledge and skills students are expected to develop through their studies. We believe that, in particular, invigilated on-campus examinations and closed-book assessments are a valid assessment approach for mathematical sciences and should be retained as options within the portfolio of assessment approaches.

Full Statement

Over recent years, university departments of mathematical sciences have substantially adapted their learning, teaching, assessment and support practices to take advantage of developments in online learning and assessment technology. This transition was accelerated by the requirement to respond to the challenges of delivering programmes of study during the Covid-19 pandemic. As learned societies with responsibility for championing the mathematical sciences and supporting those colleagues working within them, we note that the use of online assessments and take-home examinations continues to pose particular challenges.

The wide experience gained in the use of online, and therefore open-book, assessment over several years has highlighted particular pedagogical concerns. Such concerns relate to the nature of the material that can reliably be assessed, and how assessments can best be structured to enable students to successfully demonstrate their own knowledge, understanding, and application. Most significantly, its use has highlighted concerns in many institutions relating to academic integrity and whether the work submitted by any one student is indeed their own. Such concerns have not only been expressed by academic members of staff, but also by the students themselves. The assurance of academic integrity forms a necessary part of the programme accreditation by both the RSS and IMA and in ensuring the validity of all university-level awards.

Whilst the majority of students will honestly and fairly complete their assessments, concerns around academic integrity became particularly prominent during the pandemic, when assessments moved online at scale. At that time, the use of so-called ‘assessment support sites’ and contract cheating services allowed students to upload questions and receive full written answers in little over an hour. While earlier concerns around collusion, file sharing, and outsourcing remain relevant, generative artificial intelligence (AI) has fundamentally altered the landscape of academic integrity. These tools can produce

mathematically coherent answers to structured questions in seconds, often indistinguishable from student- generated work. Unlike contract cheating services, which typically resulted in reused or copied answers, generative AI typically produces a different response each time, tailored to the input it receives. This makes it significantly more difficult, if not impossible, to detect unauthorised use through conventional methods such as similarity checking or pattern recognition. Unlike earlier forms of third-party assistance, generative AI is widely accessible, difficult to trace, and does not require payment, significantly lowering the barriers to unauthorised use. While generative AI presents many opportunities to enhance learning and creativity, its increasing availability reinforces concerns regarding the authenticity of assessments conducted outside of invigilated settings. Institutions must now contend not only with traditional risks, but also with how generative AI might be used, appropriately or otherwise, by students in completing their assessments. These issues also intersect with broader questions of equity and fairness, as not all students have equal access to such tools or the confidence to use them responsibly.

As learned societies, it is not our role to specify how university departments of mathematical sciences assess their learners. However, we continue to strongly encourage innovation in assessment design, greater diversity in assessment approaches, and inclusive practices that support all students in demonstrating their mathematical knowledge and skills. In a generative AI-enabled world, and at a time when issues of equity and fairness are rightly a focus for all, we believe it is vital that invigilated on-campus examinations and closed-book assessments are retained within the portfolio of assessment options. This approach is supported by the 2023 QAA Subject Benchmark Statement for Mathematics, Statistics and Operational Research. Assessment tasks should be fit for purpose and fair, allowing learning outcomes to be appropriately assessed and ensuring learners are given equitable opportunities to demonstrate their own understanding. As in other technical subjects, there are specific bodies of knowledge that students are expected to know and understand; examinations continue to afford the ability to test this in a fair and reliable way.

We therefore encourage all universities to support their individual departments, where the academic expertise and experience relating to disciplinary learning and teaching resides, in maintaining access to the full range of assessment methodologies and techniques that are pedagogically most appropriate to each discipline. At a time of rapid technological change, it is more important than ever that departments are empowered to design diverse and balanced assessment portfolios that uphold academic integrity, support fairness, and reflect the full range of mathematical knowledge and skills students are expected to develop through their studies.

On behalf of:
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