

The Australian Mathematical Sciences Institute (AMSI) welcomes this review and the opportunity to make a submission. AMSI is a not-for-profit advocate for mathematics and mathematics education in Australia across the pipeline, from schools to higher education and research. Its mission is to champion the mathematical sciences for Australia's advancement by:

- supporting high quality mathematics education for all young Australians
- improving the supply of mathematically well-prepared students entering tertiary education by direct involvement with schools

For an overview of AMSI's activities to support and enhance the teaching of mathematics in primary and secondary schools, see also the <https://schools.amsi.org.au/>.

What are the essential skills, knowledge and capabilities students should expect to leave senior secondary schooling with to help them succeed in their post-school lives?

Good numerical skills and mathematical understanding are vital to fully and successfully participate in today's society, supporting anything from financial literacy to making informed health decisions and assessing risks. In addition, mathematics and statistics are core to the many jobs and professions that require quantitative skills. More and more professions require an advanced level of mathematical skill and knowledge. To cope with current and future realities or needs, mathematical understanding must be widespread and current gender barriers broken down. Besides mathematical knowledge and methods, mathematical education teaches rational thinking, reasoning, critical analysis, planning, pattern recognition and problem solving. The grit and persistence required to engage with more difficult mathematics problems promotes motivation and positive attitudes. For these reasons, AMSI is in favour of encouraging students to take up mathematics in high school to the highest level they are personally capable of, so they can take the resulting knowledge, skills and attitudes into their post-school pathways, be it vocational education, work or university.

The number of students completing Year 12 has been steadily increasing, as has the number of students pursuing a university degree afterwards. However, participation in senior secondary school mathematics does not reflect this change in academic aspirations. Between 2008 and 2017, the number of domestic students starting tertiary education in a STEM degree grew by nearly 50%, from 48,478 in 2008 to 71,763 in 2017. Many degrees in other areas such as management and commerce and health sciences also have quantitative components, and around one in six students in these degrees increased by 47% in the same period. This substantial increase has not been as recognised by a similarly increased take up in Year 12 of the mathematical subjects at level C (intermediate) and D (higher) intended to prepare students for university study in these degrees. Algebras, only 28.8% (80,880) of the Year 12 population studied mathematics to at least level C in 2017, compared to 31.2% (61,517) in 2008. If the relative Year 12 maths participation had remained steady at 2008 levels, more than 5,000 additional Year 12 students in 2017 alone would potentially have studied mathematics until at least intermediate level and taken that knowledge with them into post-