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Submission to Inquiry into Assessment Methods for Senior Maths, Physics and Chemistry

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Brief biographical background as basis for submission

Helen's university teaching and curriculum design experience extends across forty years of teaching, across many areas of statistical sciences and their applications, across all levels of subjects, all class sizes and most disciplines. **She has particularly specialised in teaching and mentoring first year students and engineering students.** Her work has received support through many national or university grants, including a national leadership grant and one of the first national Senior Fellowships. She has published widely, including textbooks, book chapters and more than 80 refereed, keynote or invited papers, and delivered approximately 100 local, national or international presentations and workshops on learning, teaching and assessment in statistics and quantitative learning support. **Helen established the QUT Maths Access Centre for university-wide learning support in mathematics and statistics, and was its Director from 2002-2011.**

Helen was the first female President and the first female Honorary Life Member of the Statistical Society of Australia Inc. and is now a Vice-President of the International Statistical Institute. She is a past president of the International Association for Statistical Education and of the Australian Mathematical Sciences Council. She is joint chair and editor of OZCOTS, the Australian Conference on Teaching Statistics, and member of the International Programme Executives for both the 8th and 9th International Conferences on Teaching Statistics. She has been a member of the organising or editorial committees for many conferences, including World Statistics Conferences, Australian Statistics Conferences, Southern Hemisphere Conferences on Undergraduate Mathematics and Statistics, and Australasian Engineering Education Conferences. She has chaired reviews of university departments and centres, and worked as a visiting fellow or consultant on teaching statistics and **learning support in mathematics and statistics** in Australian universities, with the Royal Statistical Society Centre in Statistical Education and the UK Higher Education Academy Learning and Teaching Support Network for Mathematics, Statistics and OR.

Helen has played key roles in mathematics and statistics school education with the Queensland Studies Authority (since 1995), the Australian national curriculum and the Australian Mathematical Sciences Institute's TIMES project. Her Queensland involvement has been on curriculum committees, state panels, core skills scrutineering and as a statistical advisor on research and moderation. Over twenty years, she has given many professional development workshops for teachers, and developed and delivered successful extension and enrichment programs in mathematics and statistics for high school students.

The focus of my submission is Senior Maths. I do not think it is appropriate for people to comment on matters of which they have little knowledge. I also focus on

Senior Maths B and C, as those responsible for getting this inquiry tend to be most critical of these subjects.

This inquiry is most unfortunate as it is taking valuable time and effort away from matters that need attention. Queensland's system of assessment for Maths B and Maths C probably has the least problems of any area of school education and is one of the best aspects of Qld school education.

The advantages of the Qld assessment system in Maths B and C include the following:

- the mix and balance of assessment methods reflect both modern maths and its practice, as well as educational research findings
- the mix and balance of assessment methods reflects modern assessment practices at universities and the requirements of a modern technological society
- it is a genuine criteria and standards based system that leaves schools and teachers free to use marks, grades and grading sheets, with the requirement being that the student's work must show evidence of meeting the criteria and standards
- the emphasis is on looking at student work and on the evidence in student portfolios
- it promotes and fosters a genuine community of practice amongst maths teachers that is not seen to the same extent in states that do not have school-based centrally-moderated assessment.

It appears that the following are some issues that may have mistakenly been ascribed to senior Maths B and C and their assessment. These are some of the issues – some long-standing – that need investigation and attention.

- avoidance of algebraic skill development in middle school
- significant decline of entry levels to university courses – this is a particular problem in some regional universities
- removal of Maths prerequisites for university courses needing the skills and knowledge of such courses
- use, misuse and misunderstanding of the term 'assumed knowledge'
- a general lack of understanding of the importance of maths skills and thinking across a whole range of courses and workplaces
- lack of adequate maths skills and training for sufficient numbers of teachers in upper primary and lower secondary
- lack of adequate understanding of, and support for, needs of students taking alternative pathways to tertiary study
- the number of OP-eligible students (has there been a decrease since publication of schools' OP scores?)
- decrease in the time given to students to compensate, consolidate and develop maths knowledge and skills in university courses such as engineering, science and business.