

## ***POINTS RAISED THROUGH ORAL SUBMISSIONS***

<b>Issues</b>
<b>1. Courses/Candidatures</b>
<ul style="list-style-type: none"> <li>• Need suitable Board-developed course for every student who would like to do a Stage 6 Mathematics course. General Mathematics is too difficult for some students.</li> </ul>
<ul style="list-style-type: none"> <li>• Stage 6 courses should continue to prepare students for further study as well as offering a richer appreciation of the world</li> </ul>
<ul style="list-style-type: none"> <li>• Retention rates in Stage 6 Mathematics are low in NSW</li> </ul>
<ul style="list-style-type: none"> <li>• Board needs to investigate the percentage of students choosing not to do any Mathematics in Stage 6</li> </ul>
<ul style="list-style-type: none"> <li>• Need an easier course under General Mathematics</li> </ul>
<ul style="list-style-type: none"> <li>• There are too many students doing General Mathematics</li> </ul>
<ul style="list-style-type: none"> <li>• General Mathematics is not a course to prepare students for University</li> </ul>
<ul style="list-style-type: none"> <li>• Must maintain Extension 1 and Extension 2</li> </ul>
<ul style="list-style-type: none"> <li>• Level of difficulty of Extension 2 examination should be addressed</li> </ul>
<ul style="list-style-type: none"> <li>• Current scaling overvalues General Mathematics</li> </ul>
<ul style="list-style-type: none"> <li>• Mathematics Life Skills course is a good course</li> </ul>
<ul style="list-style-type: none"> <li>• Need to reconsider the number of courses in Stage 6 Mathematics</li> </ul>
<ul style="list-style-type: none"> <li>• Need to consider the names of the courses and the relationship between them so that they connect appropriately with Stage 5</li> </ul>
<ul style="list-style-type: none"> <li>• Board should extend the K – 10 Continuum to K – 12 so that students can commence Stage 6 study before Year 11</li> </ul>
<ul style="list-style-type: none"> <li>• Need to encourage students to study at the highest level possible</li> </ul>
<ul style="list-style-type: none"> <li>• Courses should be hierarchical with some overlap in difficulty</li> </ul>
<ul style="list-style-type: none"> <li>• ‘Advanced/Standard’ model could be applied to the General Mathematics course</li> </ul>

<b>2. Mathematics ('2 Unit') Course</b>
<ul style="list-style-type: none"><li>• Issues with Mathematics course examination – too difficult and it advantages Extension 1 students</li></ul>
<ul style="list-style-type: none"><li>• Current 2 unit course does not serve all needs</li></ul>
<ul style="list-style-type: none"><li>• Mathematics course needs to be revised</li></ul>
<ul style="list-style-type: none"><li>• Mathematics course examination is too difficult</li></ul>
<ul style="list-style-type: none"><li>• Suggest 3 levels of the Mathematics course:<ol style="list-style-type: none"><li>1. Fundamentals of Mathematics including functions and calculus (Extension would build on this)</li><li>2. Mathematical Applications. This would allow students to move on to tertiary education in fields other than Mathematics.</li><li>3. Developmental skills for critical thinking and decision making</li></ol></li></ul>
<ul style="list-style-type: none"><li>• Need to get rid of the name “Mathematics” for the 2 Unit course</li></ul>
<ul style="list-style-type: none"><li>• Concern about drift of students from Mathematics course to General Mathematics</li></ul>
<ul style="list-style-type: none"><li>• Mathematics course needs to be treated more fairly in scaling terms in comparison to General Mathematics</li></ul>

<b>3. Statistics</b>
<ul style="list-style-type: none"><li>• A Statistics course should be included in the course provision</li></ul>
<ul style="list-style-type: none"><li>• A Statistics course should not be included in the course provision</li></ul>
<ul style="list-style-type: none"><li>• School students don't know enough statistics to do 'real' statistics</li></ul>
<ul style="list-style-type: none"><li>• Statistics using spreadsheets is not Mathematics</li></ul>
<ul style="list-style-type: none"><li>• Practical statistics is not Mathematics</li></ul>
<ul style="list-style-type: none"><li>• More statistics should not be introduced at the expense of more serious Mathematics. Could introduce a 1 unit stand-alone Statistics course.</li></ul>
<ul style="list-style-type: none"><li>• Design a separate 2 Unit Statistics course around exploratory data analysis or an Extension Statistics course building on a common 2 Unit course</li></ul>
<ul style="list-style-type: none"><li>• Extension 1 and 2 students do not need Statistics</li></ul>

*POINTS RAISED THROUGH ORAL SUBMISSIONS*

<b>4. Technology</b>
<ul style="list-style-type: none"><li>• Technology must be integral to all courses</li></ul>
<ul style="list-style-type: none"><li>• Technology should not be considered necessary</li></ul>
<ul style="list-style-type: none"><li>• An early decision should be made about technology so that all groups can be prepared</li></ul>
<ul style="list-style-type: none"><li>• Technology is not necessary in Mathematics learning</li></ul>
<ul style="list-style-type: none"><li>• There are equity issues with graphics calculator implementation</li></ul>
<ul style="list-style-type: none"><li>• The graphics calculator debate is being hijacked by graphics calculator companies</li></ul>
<ul style="list-style-type: none"><li>• Good numerical and algebraic skills have deteriorated because calculators are introduced too early</li></ul>
<ul style="list-style-type: none"><li>• Technology should be used as a tool only in the teaching of Mathematics. If technology is introduced, then teachers need access to hardware and appropriate professional development on how to use the technology</li></ul>
<ul style="list-style-type: none"><li>• Board should mandate the use of technology during lessons, assessments tasks and examinations two full calendar years prior to implementation</li></ul>
<ul style="list-style-type: none"><li>• It is not the role of the Board to mandate which technological 'tool' is to be used by students</li></ul>
<ul style="list-style-type: none"><li>• Need to consult with calculator manufacturers to develop appropriate technology for the Mathematics courses</li></ul>

<b>5. General Mathematics Preliminary/HSC Courses</b>
<ul style="list-style-type: none"><li>• There is significant difference in the difficulty of the General Mathematics Preliminary and HSC courses</li></ul>

<b>6. Content</b>
<ul style="list-style-type: none"><li>• Keep Circle Geometry in Extension 1</li></ul>
<ul style="list-style-type: none"><li>• Take Conics out of Extension 2 course and replace it with Matrices</li></ul>
<ul style="list-style-type: none"><li>• Balance needs to be maintained in putting topics into and taking topics out of courses</li></ul>
<ul style="list-style-type: none"><li>• Formal Logic should be embedded into the Extension courses</li></ul>
<ul style="list-style-type: none"><li>• The calculus courses are well structured</li></ul>
<ul style="list-style-type: none"><li>• Some topics could be removed from the calculus courses eg Mechanics</li></ul>
<ul style="list-style-type: none"><li>• Leave the calculus courses alone</li></ul>
<ul style="list-style-type: none"><li>• Calculus does not necessarily have to be part of the more difficult courses</li></ul>
<ul style="list-style-type: none"><li>• Remove Locus, Conics, Circle Geometry and Parametrics and include Matrices, Vectors, Logic, Iterative Methods, Statistics, Topology, Number Theory and Modelling</li></ul>
<ul style="list-style-type: none"><li>• There is too much content which is irrelevant and non-engaging</li></ul>

*POINTS RAISED THROUGH ORAL SUBMISSIONS*

<b>7. Other</b>
• Projects are not for school students
• A Personal Interest Project or Investigation should be included in General Mathematics
• Trendy assessment does not belong in Mathematics
• Multiple-choice is an inappropriate measure of mathematical ability
• Present structure of examinations with equal-value questions is excellent
• Mathematics should be fun and should encourage students to take their study of the subject further
• University students should have technical skills and be able to write comprehensible Mathematics
• University students should be able to think logically and have a feel for Mathematics
• It is not necessary to study only 'real world' Mathematics
• After completion of the syllabuses, need to produce specimen HSC tasks with marking schemes and examples of marked scripts
• Syllabus documents, viewable online, should contain numerous links to websites and other demonstrations of mathematical principles
• Board should establish an email network of experienced classroom teachers to act as sounding board for proposals
• The development of the structure of the courses and the syllabuses needs to involve one or more senior academics working with experienced teachers
• Students need time to learn and to build on essential understanding of abstract concepts
• Students are poorly prepared mathematically for tertiary study in Science and Engineering
• Mathematics and Extension 1 students should be assessed independently
• The calculus courses need to be taught for understanding
• There are too many General Mathematics students not reaching minimal standards
• Girls are put off by lack of success in Mathematics
• Mathematics should not be seen as an elite subject
• There must be a shift from teaching Mathematics to learning Mathematics
• NSW is currently the strongest State in Stage 6 Mathematics
• Coaching colleges are thriving because schools are not delivering courses well
• Need to consider workloads for teachers when introducing new courses
• Need to consider provision of readily accessible and relevant materials for teachers
• The aims and objectives of new courses need to be aligned with the aims and objectives of current courses
• New assessment procedures need to be commensurate with current procedures
• There needs to be appropriate provision for student input into the project