

1st Joint Meeting of the American Mathematical
Society and the New Zealand Mathematical
Society

Victoria University of Wellington
Wellington, New Zealand

December 12–15, 2007



AMERICAN MATHEMATICAL SOCIETY



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UNIVERSITY MATHEMATICS EDUCATION

Wednesday 12 December PM

CO 119

- 14.50–15.40 **Keynote:** Derek Holton
Where Have All the Mathematicians Gone?
- 16.00–16.25 David Easdown
Teaching Proofs in Mathematics
- 16.25–17.15 **Panel Chair:** Patricia Cretchley
*Writing Effective University Mathematics Texts and Courseware:
What Works, and What's New?*

Thursday 13 December PM

CO 119

- 14.50–15.40 **Keynote:** William McCallum
Secondary Mathematics from an Advanced Standpoint
- 16.00–16.25 G. Arthur Mihram
*Three Attributes of Tertiary-level Mathematical Education to
One's Society and its Advancement of Science*
- 16.25–16.50 Bill Barton
*Revisiting Felix Klein's "Elementary Mathematics from an Ad-
vanced Standpoint"*
- 16.50–17.40 **Round Table Discussion**
*What Mathematics Studies are Essential for Secondary Level
Mathematics Teachers?*

Friday 14 December AM

CO 119

- 9.50–10.15 Matthias Kawski
Interactive Visualization in Advanced University Mathematics
- 10.15–10.40 Tim Passmore
A Flexible, Extensible Online Testing System for Mathematics
- 11.00–11.25 Patricia Cretchley
*Readiness for First-Year Mathematics Studies: Management,
Placement and Prognosis*
- 11.25–11.50 Mark Nelson
*Online Learning Resources for Engineering Students: Do they
work?*
- 11.50–12.15 Alex James
*From Lessons to Lectures: NCEA Mathematics and First Year
Performance*

A Flexible, Extensible Online Testing System for Mathematics

Tim Passmore

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Coauthors: Leigh Brookshaw and Harry Butler

An online testing system developed for entry-skills testing of first-year university students in algebra and calculus is described. The system combines the open-source computer algebra system MAXIMA with PHP scripts and XML configuration files to parse student answers, which are entered using standard mathematical notation and conventions. The answers can involve data structures like lists, variable-precision-floating-point or integer numbers and algebra, which allows more sophisticated testing designs than the multiple-choice, or exact-match, paradigms common in other systems. Experience using the system and ideas for further development are discussed.