

FIELD SCIENCES**Notification of new *Mathematics* Level 3 achievement standards 90833-90836**

Subfield Domain	Mathematics Id	Subject reference
Algebra	90834, 90835	CAS Calculus 3.2, 3.3
Calculus	90833, 90836	CAS Calculus 3.1, 3.4

The Ministry of Education and the Secondary Assessment and Liaison business unit of NZQA have developed the achievement standards listed above.

Registration date **December 2008**

Planned review date **February 2011**

Summary of development and consultation process

This development was part of the planned introduction of Mathematics achievement standards in association with the Computer Algebraic Systems (CAS) Pilot Project. This project is investigating new ways of teaching mathematics and has implications for assessment of student achievement in mathematics. The development was informed by consultation and subsequent feedback from secondary schools, advisers, moderators and examiners.

During 2006 the Ministry of Education developed Level 1 CAS Mathematics achievement standards that permitted the use of this new technology. This was followed by the development of Level 2 CAS Mathematics achievement standards in 2007. The development of the Level 3 achievement standards provides an ongoing pathway for students who use the technology. They are available for use from 2009 onwards.

Results of development

Consultation has resulted in the development of four new achievement standards, three of which permit candidates to use CAS technology. In AS90836, CAS Calculus 3.4, no electronic technology may be used. The use of CAS technology is currently not permitted in the other externally assessed Mathematics achievement standards at this level.

Impact on Accreditation and Moderation Action Plan (AMAP)

These achievement standards will be added to AMAP 0226.

Impact of changes on [NCEA Exclusions List](#)

AS90833 will be mutually exclusive with AS90635, AS90636.

AS90834 will be mutually exclusive with AS90637, AS90638.

AS90835 will be mutually exclusive with AS90635, AS90636, AS90637, AS90638, and AS90639.

AS90836 will be mutually exclusive with AS90635, AS90636, AS90637, AS90638, and AS90639.

List of new achievement standards

Sciences > Mathematics > Algebra

ID	Title	Lvl	Crd
90834	Demonstrate an understanding of equations and expressions when solving problems	3	7
90835	Demonstrate an understanding of patterns and relationships when solving problems	3	5

Sciences > Mathematics > Calculus

ID	Title	Lvl	Crd
90833	Demonstrate an understanding of calculus concepts when solving differentiation and integration problems	3	7
90836	Demonstrate an understanding of mathematical concepts without the use of electronic technology	3	5