

Achievement Standard

Subject Reference	Mathematics and Statistics 1.2		
Title	Apply algebraic procedures in solving problems		
Level	1	Credits	4
		Assessment	External
Subfield	Mathematics		
Domain	Algebra		
Status	Registered	Status date	30 November 2010
Planned review date	31 December 2014	Date version published	17 November 2011

This achievement standard involves applying algebraic procedures in solving problems.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> • Apply algebraic procedures in solving problems. 	<ul style="list-style-type: none"> • Apply algebraic procedures, using relational thinking, in solving problems. 	<ul style="list-style-type: none"> • Apply algebraic procedures, using extended abstract thinking, in solving problems.

Explanatory Notes

Version 2 of this achievement standard was republished to correct an error in the status date.

- 1 This achievement standard is derived from Level 6 of *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, and is related to the material in the *Teaching and Learning Guide for Mathematics and Statistics*, Ministry of Education, 2010 at <http://seniorsecondary.tki.org.nz>. The following achievement objectives taken from the Equations and Expressions, and Patterns and Relationships threads of the Mathematics and Statistics learning area are related to this standard:
 - generalise the properties of operations with fractional numbers and integers
 - generalise the properties of operations with rational numbers including the properties of exponents
 - form and solve linear equations and inequations, quadratic and simple exponential equations, and simultaneous equations with two unknowns.

2 *Apply algebraic procedures* involves:

- selecting and using procedures in solving problems
- demonstrating knowledge of algebraic concepts and terms
- communicating solutions using appropriate mathematical symbols.

Relational thinking involves one or more of:

- selecting and carrying out a logical sequence of steps
- connecting different concepts and representations
- demonstrating understanding of concepts
- forming and using a model;

and also relating findings to a context, or communicating thinking using appropriate mathematical statements.

Extended abstract thinking involves one or more of:

- devising a strategy to investigate or solve a problem
- identifying relevant concepts in context
- developing a chain of logical reasoning, or proof
- forming a generalisation;

and also using correct mathematical statements, or communicating mathematical insight.

3 *Problems* are situations that provide opportunities to apply knowledge or understanding of mathematical concepts and procedures and methods. The situation will be set in a real-life or mathematical context.

4 Students need to be familiar with procedures related to:

- factorising
- expanding
- simplifying algebraic expressions involving exponents, such as $(2x^4)^3$ or $\frac{12a^5}{8a^7}$
- substituting values into formulae
- manipulating and simplifying expressions such as $\frac{3x}{4} - \frac{x+2}{3}$ or $\frac{3x^2-12}{x-2}$
- rearranging formulae such as $E = \frac{1}{2}mv^2$ or $\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$
- solving linear equations or inequations such as $5x + 12 = 3 - 2x$ or $3(x - 2) < 7$
- solving quadratic equations such as $(8x + 3)(x - 6) = 0$, $x^2 + 5x - 6 = 0$, $3x^2 = 10x - 8$ (completing the square and the quadratic formula are not required)
- solving simple equations involving exponents such as $x^3 = 8$, $5^x = 125$
- solving pairs of simultaneous linear equations with two unknowns.

5 Electronic technology is not permitted in the assessment of this achievement standard.

6 Assessment Specifications for this achievement standard can be accessed through the Mathematics and Statistics Resources page found at <http://www.nzqa.govt.nz/qualifications-standards/qualifications/ncea/ncea-subject-resources/>.

Replacement Information

This achievement standard replaced unit standard 5239.

Quality Assurance

- 1 Providers and Industry Training Organisations must have been granted consent to assess by NZQA before they can register credits from assessment against achievement standards.
- 2 Organisations with consent to assess and Industry Training Organisations assessing against achievement standards must engage with the moderation system that applies to those achievement standards.

Consent and Moderation Requirements (CMR) reference

0233