Achievement Standard

Subject Reference Mathematics 2.1

Title Manipulate algebraic expressions and solve equations

Level 2 **Credits** 4 **Assessment** External

Subfield Mathematics

Domain Algebra

Registration date 20 October 2004 **Date version published** 20 October 2004

This achievement standard requires the manipulation of algebraic expressions and the solution of equations.

Achievement Criteria

	Achievement Criteria	Explanatory Notes
Achievement	• Manipulate algebraic expressions.	• Assessment of manipulation will be based on a selection from: – expanding brackets up to 3 factors – factorising expressions including quadratics – using fractional and negative indices – using elementary properties of logarithms – simplifying rational expressions.
	• Solve equations.	• Assessment of solving equations will be based on a selection from: – multi-step linear equations or inequations eg $3(2x-5)=5x+7$ – quadratics that can be factorised eg $2x^2-11x=21$ – simple logarithmic equations eg $\log_x 25=2,\ 3^x=25$ – forming and solving linear/linear simultaneous equations.

	Achievement Criteria	Explanatory Notes
Achievement with Merit	• Solve problems involving equations.	• Assessment will be based on a selection from: – quadratics requiring the use of the quadratic formula – linear/non-linear simultaneous equations – exponential eg $13^{4x-5} = 6$. • Non-linear equations may be given as appropriate to the complexity of the problem. • Students will be expected to solve problems in context.
Achievement with Excellence	• Choose algebraic techniques and strategies to solve problem(s).	• When solving a problem the student may be required to: – interpret the solution – explore the nature of the roots of a quadratic – complete a multi-step algebraic manipulation – complete an algebraic proof.

General Explanatory Notes

1 This achievement standard is derived from *Mathematics in the New Zealand Curriculum*, Learning Media, Ministry of Education, 1992:
- achievement objectives p. 158
- suggested learning experiences p. 159
- sample assessment activities pp. 160-161
- mathematical processes p. 26.

2 The use of the Factor/Remainder Theorem will not be assessed.

3 An algebraic proof will involve a multi-step manipulation of a given algebraic statement to generate another given expression.

4 For this standard the problems may be set in a mathematical context.

Quality Assurance

1 Providers and Industry Training Organisations must be accredited by the Qualifications Authority before they can register credits from assessment against achievement standards.

2 Accredited providers and Industry Training Organisations assessing against achievement standards must engage with the moderation system that applies to those achievement standards.

Accreditation and Moderation Action Plan (AMAP) reference 0226