Achievement Standard

Subject Reference Mathematics and Statistics 2.12

Title Apply probability methods in solving problems

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

Subfield Statistics and Probability

Domain Probability

Status Registered **Status date** 17 November 2011

Planned review date 31 December 2014 **Date version published** 17 November 2011

This achievement standard involves applying probability methods in solving problems.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
• Apply probability methods in solving problems.	• Apply probability methods, using relational thinking, in solving problems.	• Apply probability methods, using extended abstract thinking, in solving problems.

Explanatory Notes

1   This achievement standard is derived from Level 7 of *The New Zealand Curriculum,* Learning Media, Ministry of Education, 2007; and is related to the achievement objectives
   • evaluate statistically based reports
     – interpreting risk and relative risk
   • investigate situations that involve elements of chance
     – comparing theoretical continuous distributions, such as the normal distribution, with experimental distributions
     – calculating probabilities, using such tools such as two-way tables, tree diagrams
   in the Statistics strand of the Mathematics and Statistics Learning Area. It is also related to the material in the *Teaching and Learning Guide for Mathematics and Statistics*, Ministry of Education, 2010 at http://seniorsecondary.tki.org.nz.

2   *Apply probability methods in solving problems* involves:
   • selecting and using methods
   • demonstrating knowledge of probability concepts and terms
   • communicating using appropriate representations.

Relational thinking involves one or more of:
- selecting and carrying out a logical sequence of steps
- connecting different concepts or representations
- demonstrating understanding of concepts;

and also relating findings to a context or communicating thinking using appropriate 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
- making a statistical generalisation;

and also where appropriate, using contextual knowledge to reflect on the answer.

3   *Problems* are situations which provide opportunities to apply knowledge or understanding of mathematical and statistical concepts. Situations will be set in real-life or statistical contexts.

4   Methods include a selection from those related to:
- risk and relative risk
- the normal distribution
- experimental distributions
- relative frequencies
- two-way tables
- probability trees.

5   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 and AS91268 replaced AS90289 and unit standard 5250.

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