

## Achievement Standard

<b>Subject Reference</b>	Mathematics and Statistics 3.14		
<b>Title</b>	Apply probability distributions in solving problems		
<b>Level</b>	3	<b>Credits</b>	4
		<b>Assessment</b>	External
<b>Subfield</b>	Statistics and Probability		
<b>Domain</b>	Probability		
<b>Status</b>	Registered	<b>Status date</b>	4 December 2012
<b>Planned review date</b>	31 December 2016	<b>Date version published</b>	16 September 2013

This achievement standard involves applying probability distributions in solving problems.

### Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Apply probability distributions in solving problems.</li> </ul>	<ul style="list-style-type: none"> <li>Apply probability distributions, using relational thinking, in solving problems.</li> </ul>	<ul style="list-style-type: none"> <li>Apply probability distributions, using extended abstract thinking, in solving problems.</li> </ul>

### Explanatory Notes

- This achievement standard is derived from Level 8 of *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007; and is related to the achievement objectives:
  - Investigate situations that involve elements of chance
    - calculating and interpreting expected values and standard deviations of discrete random variables
    - applying distributions such as the Poisson, binomial, and normal 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, 2012, at <http://seniorsecondary.tki.org.nz>.
- Apply probability distributions in solving problems* involves:
  - selecting and using methods
  - demonstrating knowledge of 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 generalisation;

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

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

4 Methods are selected from those related to:

- discrete and continuous probability distributions
- mean and standard deviation of random variables
- distribution of true probabilities versus distribution of model estimates of probabilities versus distribution of experimental estimates of probabilities.

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/subjects/>.

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### Replacement Information

This achievement standard replaced unit standard 5258, unit 5259 and AS90646.

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### 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