

## Achievement Standard

**Subject Reference** Mathematics and Statistics 1.6

**Title** Apply geometric reasoning in solving problems

**Level** 1      **Credits** 4      **Assessment** External

**Subfield** Mathematics

**Domain** Geometry

**Status** Registered      **Status date** 30 November 2010

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

This achievement standard involves applying geometric reasoning in solving problems.

### Achievement Criteria

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

### Explanatory Notes

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

- 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 Shape thread of the Mathematics and Statistics learning area are related to this achievement standard:
  - deduce the angle properties of intersecting and parallel lines and the angle properties of polygons and apply these properties
  - recognise when shapes are similar and use proportional reasoning to find an unknown length
  - use trigonometric ratios and Pythagoras' theorem in two dimensions
  - deduce and apply the angle properties related to circles.
- Apply geometric reasoning* involves:
  - selecting and using methods in solving problems

- demonstrating knowledge of geometrical concepts and terms
- communicating solutions which would usually require only one or two steps.

*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 methods. The situation will be set in a real-life or mathematical context.
- 4 Students need to be familiar with methods related to:
  - Pythagoras' theorem
  - trigonometric relationships in right-angled triangles
  - similar triangles
  - angle properties of intersecting and parallel lines
  - angle properties of polygons
  - angle properties of circles.
- 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/>.

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### Replacement Information

This achievement standard replaced unit standard 5252.

**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