

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	9 December 2010
Planned review date	31 December 2014	Date version published	9 December 2010

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

Explanatory Notes

- 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 a range of 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 The phrase 'a range of methods' indicates that evidence of the application of at least three different methods is required.
- 5 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.
- 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 5252.

Quality Assurance

- 1 Providers and Industry Training Organisations must be accredited by NZQA 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

0233