Achievement Standard

Subject Reference   Mathematics and Statistics 1.7

Title   Apply right-angled triangles in solving measurement problems

Level   1   **Credits**   3   **Assessment**   Internal

Subfield   Mathematics

Domain   Trigonometry

Status   Registered   **Status date**   9 December 2010

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

This achievement standard involves applying right-angled triangles in solving measurement problems.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
• Apply right-angled triangles in solving measurement problems.	• Apply right-angled triangles, using relational thinking, in solving measurement problems.	• Apply right-angled triangles, using extended abstract thinking, in solving measurement problems.

Explanatory Notes

1   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 and Measurement threads of the Mathematics and Statistics learning area are related to this achievement standard:
   • use trigonometric ratios and Pythagoras' theorem in two and three dimensions
   • recognise when shapes are similar and use proportional reasoning to find an unknown length
   • select and use appropriate metric units for length and area
   • measure at a level of precision appropriate to the task.

2   *Apply right-angled triangles* involves:
   • selecting and using a range of methods in solving measurement problems
   • demonstrating knowledge of measurement and geometric 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 set in a real-life context which provide opportunities to apply knowledge or understanding of mathematical concepts and methods. For assessment, situations may involve non right-angled triangles which can be divided into right-angled triangles.

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 ratios (sine, cosine, tangent)
- similar shapes
- measuring at a level of precision appropriate to the task.

6   Conditions of Assessment related to this achievement standard can be found at www.tki.org.nz/e/community/ncea/conditions-assessment.php.

Replacement Information
This achievement standard replaced AS90152.

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