

National Certificate of Educational Achievement

2012 Assessment Report

Mathematics and Statistics Level 1

- 91027 Apply algebraic procedures in solving problems**
- 91028 Investigate relationships between tables, equations and graphs**
- 91031 Apply geometric reasoning in solving problems**
- 91037 Demonstrate understanding of chance and data**

COMMENTARY

Candidates maximise their opportunities for success in standards by:

- attempting all parts of all questions
- showing working and/or providing explanations
- using methods other than guess and check.

Candidates need to be able to:

- interpret their solutions in context
- apply number and algebra and graphing skills and interpretation across standards
- generalise situations. This may require use of algebra skills
- use correct mathematical and statistical language and communicate this effectively
- present a clear, accurate and logical argument or proof
- combine an understanding of concepts in a coherent manner
- use algebraic reasoning in explanations
- communicate mathematical insight.

STANDARD REPORTS

91027 Apply algebraic procedures in solving problems

VERIFICATION

The most common errors in the assessing of the candidate work was due to

- misinterpretation of a document explaining the assessment schedule, and not using the updated assessment schedule
- failing to recognise that the awarding of the required number of u (“understanding” - achievement evidence), r (“relational thinking” - merit evidence) and t (“extended abstract thinking” - excellence evidence) is sufficient and does not require the support of evidence from a lower level of achievement. This means that it is no longer appropriate to use merit level evidence to replace an error at achievement level.

91028 Investigate relationships between tables, equations and graphs

ACHIEVEMENT

Candidates who were awarded Achievement for this standard demonstrated the required skills and knowledge. They commonly:

- drew linear graphs
- interpreted linear graphs in context.

NOT ACHIEVED

Candidates who were awarded Not Achieved for this standard lacked some or all of the skills and knowledge required for the award of Achievement. They commonly:

- had difficulty interpreting any graphs in context
- were unable to evaluate expressions
- were unable to use the scales for graph axes.

ACHIEVEMENT WITH MERIT

In addition to the skills and knowledge required for the award of Achievement, candidates who were awarded Achievement with Merit commonly:

- formed equations for linear graphs and a straightforward parabola
- drew parabolas and could interpret parabolas in context
- used key features and transformations of linear and non-linear graphs to make comparisons.

ACHIEVEMENT WITH EXCELLENCE

In addition to the skills and knowledge required for the award of Achievement with Merit, candidates who were awarded Achievement with Excellence commonly:

- formed an equation to describe a parabolic context
- drew and could interpret step functions in context
- identified key words in questions and focused on them when writing responses
- included coherent written explanations with their responses.

OTHER COMMENTS

At all levels of achievement, there were frequent instances of candidates not using and not understanding terminology and conventions associated with the content of this standard, e.g.

- the coordinates of points are expressed as (x, y) ;
- ... equations have at least one term on either side of an “=” sign
- vocabulary: gradient, intercept, intersection, continuous, discrete, parallel, consecutive, horizontal, vertical, straight, curve, translate.

91031 Apply geometric reasoning in solving problems

ACHIEVEMENT

Candidates who were awarded Achievement for this standard demonstrated the required skills and knowledge. They commonly:

- used correct trigonometric ratios
- understood the concept of similar triangles
- used Pythagoras' Theorem correctly
- interpreted questions correctly
- understood simple intersecting and parallel line angle relationships
- understood simple angles in triangles properties
- understood angle properties of polygons
- understood simple angle properties of circle geometry.

NOT ACHIEVED

Candidates who were awarded Not Achieved for this standard lacked some or all of the skills and knowledge required for the award of Achievement. They commonly:

- did not interpret questions correctly
- had little or no understanding of the concepts mentioned above
- were unable to develop clear and logical reasoning.

ACHIEVEMENT WITH MERIT

In addition to the skills and knowledge required for the award of Achievement, candidates who were awarded Achievement with Merit commonly:

- demonstrated a better understanding and grasp of the concepts mentioned under Achievement
- made progress with a question using correct reasoning
- interpreted questions using bearings
- failed to make final concluding statements that were required for Excellence.

ACHIEVEMENT WITH EXCELLENCE

In addition to the skills and knowledge required for the award of Achievement with Merit, candidates who were awarded Achievement with Excellence commonly:

- were able to present a clear, accurate and logical geometrical argument or proof.

91037 Demonstrate understanding of chance and data

The questions were, in many cases, open-ended. Candidates who achieved well answered the questions in a way that showcased their understanding to the highest level of which they are capable. A candidate's answer to a question may be used to award any grade, but this depends on the quality (not quantity!) of their answer.

Candidates need familiarity with a range of graphs and statistics and need to be able to relate them to the context in hand. Candidates who achieved well in this standard showed familiarity with the statistical enquiry cycle and critically evaluated the experimental contexts presented.

Most candidates who achieved the standard showed an ability to read graphs and answer questions about statistics across a range of contexts. Candidates do need to have experience in, and an understanding of, a variety of statistical investigations to successfully attempt this standard.

ACHIEVEMENT

Candidates who were awarded Achievement for this standard demonstrated the required skills and knowledge. They commonly:

- correctly answered questions about graphs and statistics across a range of contexts
- correctly identified relationships, probabilities, statistical features and variation in data
- expressed statistical ideas clearly making use of appropriate language
- were able to make basic interpretations of graphs and statistics
- made sensible suggestions as to how to improve an investigation.

NOT ACHIEVED

Candidates who were awarded Not Achieved for this standard lacked some or all of the skills and knowledge required for the award of Achievement. They commonly:

- did not answer the questions accurately
- gave no statistical reasoning behind their answer even though it was requested
- did not correctly evaluate simple probabilities from information presented in a table

- lacked an understanding of what a graph was illustrating.

ACHIEVEMENT WITH MERIT

In addition to the skills and knowledge required for the award of Achievement, candidates who were awarded Achievement with Merit commonly:

- correctly interpreted statistical graphs in close detail
- reflected on the validity of a statistical result and were circumspect about how strong a conclusion could be drawn
- understood the difference between measures of spread and measures of central tendency
- generally answered the questions according to the instructions, giving requested detail, reasons or answers
- were familiar, from personal experience, with the process of statistical investigation.

ACHIEVEMENT WITH EXCELLENCE

In addition to the skills and knowledge required for the award of Achievement with Merit, candidates who were awarded Achievement with Excellence commonly:

- used valid statistical approaches to decide if an observed result was significant or not
- interpreted graphs carefully and gave clear detail about what they observed
- made insightful suggestions about how investigations might be improved
- calculated probabilities at a high level of difficulty.