2015 NZ Scholarship Assessment Report

Calculus

Part A: Commentary

Comment on the overall response of candidates to the 2015 examination. This examination proved challenging as many students could not recognize the algebra techniques used in solving the problems. The paper had a range of questions that covered the curriculum, although the candidates found the optional question on 'Conics' harder than the other optional question on 'System of Equations'. Candidates coped well with the change in format with the optional question only occurring once as opposed to in every question of the previous year.

Part B: Report on performance standard

Scholarship with Outstanding Performance	Candidates who were awarded Scholarship with Outstanding Performance commonly: • showed excellent algebraic manipulation skills • demonstrated the ability to relate geometric principles to algebra • were able to solve problems involving a variety of symbols and notations • laid out their working logically and clearly • recognised that there were restrictions on domains and ranges that affected their solutions and checked the validity of their answers • could integrate accurately, including using partial fractions • were able to simplify intermediate results before proceeding to further work • applied knowledge across different stands of the curriculum • recognised and were able to factorise quadratic expressions in terms of other variables and understood the nature of the roots.
Scholarship	Candidates who were awarded Scholarship commonly: • could effectively use trigonometry identities to prove mathematical statements • could differentiate and integrate complex expressions correctly and recognise when partial fractions should be used • could form constraints correctly from a word problem • could link diagrams to problems effectively • had sound algebra skills in solving quadratic equations and manipulating logarithm and exponential expressions.
Other candidates	Candidates who were not awarded Scholarship commonly: • oversimplified problems • did not use graphics calculator in finding the definite integral • were unable to form algebraic equations or inequations • could not manipulate logarithms correctly • did not understand definite integral and substituted limits without actually integrating • had limited trigonometric manipulation skills • could not find the equation of a parabola or the equation of a normal • failed to identify quadratic equations in a disguised form • could not integrate partial fractions • had weak algebra manipulation skills.