Response to Claire Laverty on Friday 30th September

Dear Claire,

Thank you again for drawing your concerns to my attention and giving me the opportunity to clarify our processes.

NZQA publishes Assessment Specifications for each NCEA subject and level each year to alert teachers to specific information relating to the up-coming examinations or assessments. This information may relate to significant changes to the format or style of questions, or to particular topic or emphases that students will need to be familiar with before they sit the assessment.

In the case of level 1 Mathematics and Statistics 91027 (MCAT), there have been changes in the style of questions since the standard was first introduced in 2011, derived from the achievement objectives in the then new curriculum. These changes are not a reinterpretation of the standard, but reflect the changes in the Mathematics and Statistics learning area of the New Zealand Curriculum, which was mandated in 2010. NZQA took a phased approach to moving the assessment to better align with the standard and the curriculum, in order to ensure that student achievement was not adversely affected, and a number of straight "skills-type" questions were retained. This ensured student achievement was reasonably comparable from previous years of NCEA assessment. NZQA works to avoid large swings in achievement from one year to the next, particularly in subjects with a large cohort such as Mathematics.

However, the standard is about using algebraic procedures in problem solving, and it would not be appropriate for students to be able to gain achievement in 91027 "Apply algebraic procedures in solving problems" without solving any problems. Beginning at the end of 2014 (in the notes to markers in the MCAT assessment schedules), NZQA indicated that in future it would not be possible for students to gain achievement without problem solving.

As defined in the standard, problems can be set in real-life or mathematical contexts. In the MCAT assessment both are used. NZQA has never indicated that only open-ended problems will be used.

The differences between levels 1 and 2 (and this can be extended to level 3) recognise that as more complex concepts and procedures are encountered, it may be more appropriate to use more simple mathematical contexts than real-life contexts: The level of difficulty of the mathematics is such that placing it in a real-life context (particularly if this is a trivial or contrived context) may result in unacceptably difficult problems.

The decisions about the style of questions that are used are made by our examination development teams, not by a single person as you have indicated, and this includes discussion across levels (eg level 1 algebra and level 2 algebra), and not each level in isolation.

Regards

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'Ahakoa ngaru ana te moana, ka eke tonu nei te waka'
A choppy mountainous ocean can always be navigated by a small canoe!

This was in response to this letter that Claire sent on 22 September

Dear Ms Chalmers

I am disturbed by the changing assessment specifications being used to reinterpret and largely change the MCAT standard when the standard has not been rewritten.

The Level **2** Algebra exam assesses algebra skills. While many of the problems have sort of real-life context, the questions do actually say "simplify", "factorise", "solve" etc.

There is nothing in the STANDARD document that suggests that solving problems always means "problem-solving" in the loose, lateral thinking sense. In fact, the standard specifically states that the problems can be MATHS problems. The definition of "problems" is IDENTICAL for the two standards.

L1 MCAT Standard	L2 Algebra Standard
Title	Title
Apply algebraic procedures in solving problems	Apply algebraic methods in solving problems
From Standard document	**From Standard document**
Problems are situations that provide opportunities to apply knowledge or understanding of mathematical concepts and procedures and methods. The situation will be set in a real-life or mathematical context.	Problems are situations that provide opportunities to apply knowledge or understanding of mathematical concepts and methods. Situations will be set in real-life or mathematical contexts.
Assessment specifications document	**Assessment specifications document**
An ENORMOUS amount of content, including	Only reference to non-algebraic context questions :
To meet the requirement of the standard with respect to solving problems, candidates will not be able to provide evidence by following a direction to solve factorised quadratics, factorise, expand, write or solve a linear equation, or simplify an expression involving the collection of like terms in response to being told to. No part of any question will direct the candidate to perform a specific procedure unless there is an intermediary procedure required in order to solve a problem.	"Any equations formed by the candidate must be stated in solving a problem." "Given the form of a model, the candidates may be required to complete the model using the information given in the context of the question. "Clarifications" are very short and actually clarify some points of algebra.

The redefining of what "solving problems" means has not been done through a rewriting of the standard. Rather, the large amount of "assessment specifications" have changed the whole nature of the assessment and the standard has therefore effectively been rewritten by the examiner, something that surely exceeds their jurisdiction. Of concern is the comment in the assessment specifications that in Level 1 Algebra "no part of any question will direct the candidate to perform a specific procedure". The Level 2 examiner introduces no such conceit and the instructions are clear. Note all the process words in the Level 2 exam from last year....

2015 Level 2 exam questions

(a) (i)   Find the value of $\log_2 1024$.

     (ii) Solve the equation $\log_4(3w + 1) = 2$.

(b)   Make x the subject of the equation $a^{2x} = b^{x+1}$.

(a)   Simplify $\dfrac{2x^2 + 7x - 4}{2x^2 - 32}$

(b)   Solve the following equation for t:
$$\frac{1}{t(t-1)} - \frac{1}{t} = \frac{3}{t-1}$$

(b)   If $a = y^{\frac{3}{4}}$, find an expression for a^7 in terms of y.

The standard is not a problem. The power given to one person to change the entire nature of the standard (and write vague exams where algebra is not the main focus) is.

Regards,

Claire Laverty