



NEW ZEALAND **QUALIFICATIONS** AUTHORITY
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Aide-Memoire: NCEA Results Release Update

To:	Hon Chris Hipkins, Minister of Education
From:	Alex Bidois, Acting Chief Executive
Date:	9 January 2020
Reference:	CR 20090

Purpose

1. This aide memoire is to update you on two matters, ahead of NCEA Results Release on Tuesday 14 January 2020:
 - the marking of, and grade distributions for the Level 2 Mathematics and Statistics examination [CR19907, CR19938 and CR20015 refer; ¹
 - the management of a data saving issue which arose during the NCEA Online examinations affecting 145 students. This issue was notified to your office on 6 December 2019. A summary of other small technical issues that occurred during the online examinations is also included.
2. NZQA proposes to proactively release this briefing in February following release of NCEA and New Zealand Scholarship results.

Level 2 Mathematics and Statistics examination

3. There were two issues relating to the Level 2 Mathematics and Statistics examination held on Thursday 21 November. The first was an error in one part of one question (Question 2d), designed to assess Excellence, in the Algebra paper [91261 *Apply algebraic methods in solving problems*]. The second was feedback that the Calculus paper [91262 *Apply calculus methods in solving problems*] was more difficult than students had expected.

¹ **CR19907**, Briefing Note: Level 2 Mathematics and Statistics Examination, 25 November 2019, **CR19938**, Briefing Note: Level 2 Mathematics and Statistics Examination Review, 25 November 2019 and **CR20015**, Briefing Note: Level 2 Mathematics and Statistics Examination Review update, 12 December 2019.

Level 2 Algebra

4. The error in Question 2d related to a diagram. It could only be detected if a candidate, having partially solved the problem, checked their calculations by substituting the values for 'x' and 'y' in the diagram. Candidates were not required to check their calculations this way and could proceed to solve the problem without reference to the diagram.
5. The NZQA marking panel leader has reported the error did not affect the overall results for the Algebra paper. Most candidates who completed the task, did so as instructed and then proceeded to the next task. Those candidates who completed the task and crossed it out were not penalised, as the crossed-out work was considered for assessment. Candidates were still able to demonstrate their mathematical competencies to a sufficient level for the marker to recognise they were able to meet the requirements for Excellence.
6. The proportion of students gaining Excellence for the paper in 2019 is similar to 2018. In 2019, 13,455 students sat this paper, with 2,428 students (18%) gaining an Excellence. By comparison, in 2018 14,004 sat the paper, with 2,372 students (17%) gaining an Excellence.
7. The NZQA marking panel leader considered this paper was straightforward, and accessible. NZQA is satisfied that there are no unusual patterns to the grade distributions for this paper for 2019.

Level 2 Calculus

8. The NZQA marking panel leader considered the examination to be within the appropriate Mathematics curriculum level (Level 7). Each question contained tasks accessible to all candidates with sufficient knowledge of calculus. However, some of the tasks were demanding, particularly at the Excellence level. Some of the tasks required a knowledge of algebra (which is reasonable) but this may have contributed to the perception that the paper was difficult.
9. There are variances in the grade distribution for this paper in 2019 compared to 2018. There are proportionally fewer merit and excellence grades attained. Variances of three to four per cent from year to year are usual in a cohort of this size and most mathematics papers will have these types of variances.
10. Appendix 1 to this paper shows the grade distributions for the Level 2 Mathematics and Statistics examination for the last four years – 2016 to 2019.

Management of the issue

11. There were 34,465 students who were entered for the Level 2 Mathematics and Statistics examination. NZQA responded to 56 complaints relating to the Level 2 Mathematics and Statistics examination. NZQA's responses to students, parents, and teachers provided assurance that NZQA's processes are focused on achieving fairness for all students.
12. NZQA established a review panel in December 2019 to investigate why the error in the Level 2 Algebra paper was not identified during the multiple checks and controls that are applied to examination papers and whether changes are necessary to assurance procedures and methods for these types of questions. The review will be completed in early February 2020. The review will help us to understand how the error occurred, so we can strengthen our existing processes. We will provide you with the outcome, recommendations and actions, once the review is completed in early February.

NCEA Online examinations

13. As part of the 2019 examination round, NZQA offered 35 digital examinations at approximately 200 schools, with just under 20,000 students entered [CR 19957 refers²].
14. NZQA is in the process of analysing digital examinations data to finalise participation statistics and to better understand the extent to which students reverted to paper prior to and during an examination session. Based on Examination Centre Manager reports and results processing, the number of students who switched from digital to paper during (not before) an examination was very low. The fuller analysis will be provided to you by 10 February, and the 2019 NCEA Online User Experience Evaluation by late April 2020.
15. A small number of students experienced technical issues, with causes traceable to their device, the school infrastructure and internet connectivity, or the assessment software. The most significant of these issues was a data saving issue which affected 145 students at 53 schools (0.4% of the student digital responses) across 17 examinations. This was related to the assessment software. The other issues mostly related to internet connectivity and most were resolved without impacting the students. More detail is provided below.

NCEA Online data saving issue management

16. Between 8 and 27 November a limited impact software defect affected 145 students who did not have some of their response data saved. The 53 schools affected had between one and 21 affected students, with the majority having between one and five students.
17. On 27 November the vendor notified NZQA that it had identified a set of circumstances in which a particular string of characters in the student response would trigger a software command that meant subsequent data for that question would not be saved.
18. Once the issue was notified NZQA implemented a fix from the vendor so that if a student's response triggered the software command, their work would still be saved. A full fix for this issue will be implemented in 2020.
19. NZQA was able to quickly identify which students may have been affected by this issue, then contacted their schools and sought confirmation that affected students had the correct Unexpected Event Grade recorded in the system should it be needed. NZQA also planned the approach to marking these students' responses. These processes ensure that no student was disadvantaged by this incident.
20. All 145 students affected by this issue have had the better of their marked response or the school supplied Unexpected Event Grade applied to their result.
21. All students affected by this issue will be provided with information when they log into the NZQA Learner portal to check their results from 14 January.

Other NCEA Online technical issues

22. N4L were engaged to assist NZQA in monitoring internet access into schools, potential security threats towards schools participating in NCEA Online, and NCEA Online examination dashboards during the examination period. In order to provide a focus on more significant outages, rather than isolated incidents due to normal temporary fluctuations in the strength of internet connectivity, N4L were asked to contact schools only when 20% or more of the digital students sitting an examination had lost connectivity to the internet at the same time.

² CR19957, Aide-Memoire: 2019 NCEA Online Summary, 2 December 2019

23. There were 15 incidents where N4L contacted schools due to lost connectivity to the Digital Assessment system. Of these 15 incidents, 13 were resolved with no impact on the student, one incident resulted in a single student reverting to paper during the exam, and one incident resulted in two students reverting to paper prior to start of the examination.
24. A further incident was a major power outage in Northland on the morning of 27 November that resulted in three schools following the agreed procedure of reverting to paper examination for the Media Studies Level 1.
25. In addition, a distributed denial-of-service (DDoS) attack occurred at one school. As this was an N4L managed school the process of blocking the attack was automatically activated with no impact on the examination.



Alex Bidois

Acting Chief Executive, NZQA

9 January 2020

Noted/Agreed

Hon Chris Hipkins

Minister of Education

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Grade distributions for Level 2 Mathematics and Statistics examination 2016 to 2019

Table 1: Grade distributions for standard 91261 Apply algebraic methods in solving problems

Year	Not Achieved	Achieved	Merit	Excellence	Total assessed results
2016	27%	35%	29%	9%	12,175
2017	28%	32%	27%	13%	14,998
2018	21%	32%	30%	17%	14,004
2019	24%	25%	32%	18%	13,455

Table 2: Grade distributions for standard 91262 Apply calculus methods in solving problems

Year	Not Achieved	Achieved	Merit	Excellence	Total assessed results
2016	26%	31%	28%	14%	16,631
2017	23%	28%	31%	19%	15,995
2018	27%	22%	29%	22%	15,615
2019	30%	31%	24%	15%	14,786

Table 3: Grade distributions for standard 91267 Apply probability methods in solving problems

Year	Not Achieved	Achieved	Merit	Excellence	Total assessed results
2016	23%	35%	30%	12%	25,525
2017	23%	34%	31%	12%	24,881
2018	24%	31%	32%	12%	23,702
2019	28%	31%	31%	11%	21,755