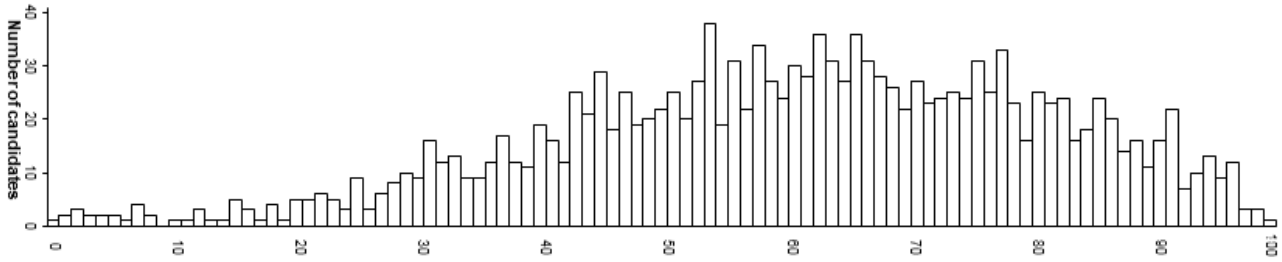
Government of **Western Australia**
School Curriculum and Standards Authority

Summary report for candidates on the 2015 WACE examination in
Mathematics: Specialist 3C/3D

Year	Number who sat	Number of absentees
2015	1546	15
2014	1250	23
2013	1523	16

Examination score distribution - Written



Summary
The examination had a mean of 61.15%. Candidate scores for the examination ranged from a minimum of 0.00% to a maximum of 99.67%. The standard deviation was 19.94%. The section means were: Section One: Calculator-free 59.09% with a standard deviation of 21.83%; and Section Two: Calculator-assumed 62.28% and a standard deviation of 19.79%.

General comments
Written examination

Overall the examination proved to be a good test of the range of candidates with marks spanning the full range. The mean mark of a little over 61% was the highest of recent years. The two sections of the examination had very similar scores with, unusually, the Calculator-assumed section faring a little better than the Calculator-free section. The paper had a good internal reliability coefficient and the two sections each correlated excellently with the overall.

As has been commented upon for a number of years, the quality of some of the explanations and working steps was disappointing. Too many candidates did not explain what they were doing and the sequence of steps was sometimes illogical. Some candidates did not read the questions carefully enough and failed to appreciate the meanings of several key words (a classic example was the use of ‘Hence’ in Question 6(b) which required use of the answer to 6(a)).

This year, for the first time, revealed the overuse or over-dependence on the CAS calculators. Some candidates used the calculator for the most elementary of tasks (e.g. solving the equation $N(200-N)=0$ on the calculator). Anecdotal evidence is that some candidates are being encouraged to do everything possible on CAS and do only what the calculator cannot. It should be emphasised that use of the calculator does not demonstrate any understanding of the concepts involved and that if the machine is used then the answer needs to be accompanied by sufficient reasoning/explanation in order for the marker to appreciate what has been done. Many candidates lost marks unnecessarily through poor or non-existent explanation or justification. Others performed calculations in inappropriate units (using degrees when they should have been using radians or vice-versa).

Also this year there seemed to be many more candidates who wrote in such small handwriting that it was impossible for the markers (even with magnification) to discern what was written. Some scripts

were hard to read possibly because pencils were used rather than pens. Others had handwriting that was so untidy that the content was rendered almost indecipherable.

Both teachers and candidates need to appreciate that many candidates lost marks owing to careless mistakes in the elementary skills of algebra, numeracy and manipulation. Several candidates lost an appreciable number of marks because careless errors early in the answer of a question had flow-on effects that meant latter parts of the question became much more difficult than intended, if not totally impossible.

There seemed to be more confusion than previously in distinguishing notation for polar coordinates, vectors and complex numbers. Question 3, concerning polar coordinates, was frequently answered in terms of complex numbers and the opposite seemed to be the case for Question 15.

Advice to candidates

- the sequence of working steps must be logical
- marks can be lost unnecessarily through poor or non-existent explanation or justification
- read the questions carefully and note the meanings of key words
- use pens rather than pencils
- keep handwriting legible

Comments on specific sections and questions

Section One: Calculator-free
Attempted by 1545 Candidates Mean 19.70(/33.33) Max 33.33 Min 0.00

This section of the examination contained eight questions based on topics taken from various parts of the syllabus. Question 3 proved to be the best answered, but this is not surprising as it was a very straightforward test of elementary polar coordinates. Question 1 was also answered well in the main but it was somewhat disappointing that Questions 2 and 7 were done less well. The former required candidates to construct a proof and too many seemed unable to start. On the other hand Question 7 asked candidates to reproduce the key steps in what should have been a well known textbook piece of theory.

Section Two: Calculator-assumed
Attempted by 1544 Candidates Mean 41.52(/66.66) Max 66.66 Min 0.00

The overall performance in this section was slightly better than that in Section One. Apart from Question 9, which was a simple question relatively on matrix theory, it was noteworthy that the other best answered questions (10, 11 and 17) were tasks that either demanded the use of the calculator or at least could be made much more straightforward if that strategy was adopted. It was disappointing that the routine question on simple harmonic motion (Question 13) was not done as well as it should have been and, as might have been anticipated at the outset, it was Questions 12 and 21, both involving calculations but set in unfamiliar contexts, that were answered the most poorly.