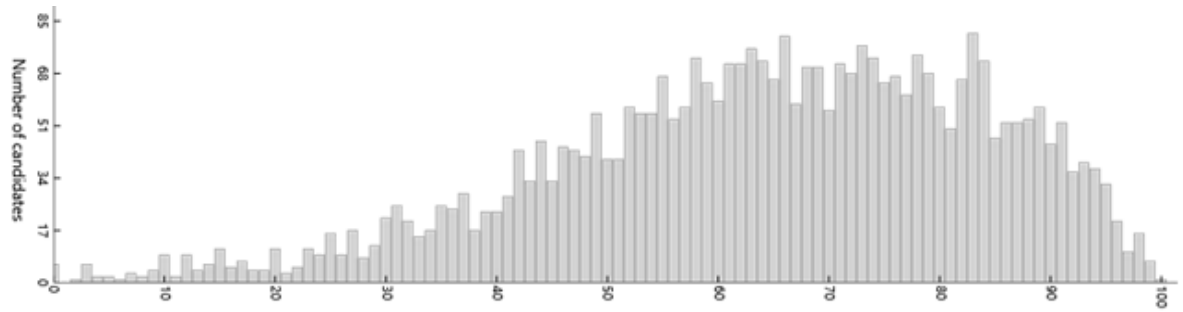
Summary report of the 2023 ATAR course examination report: Mathematics Methods

Year	Number who sat	Number of absentees
2023	3611	38
2022	3590	65
2021	3997	55
2020	4094	60

The number of candidates sitting and the number attempting each section of the examination can differ as a result of non-attempts across sections of the examination.

Examination score distribution



Summary

The examination consisted of two sections, Section One: Calculator-free and Section Two: Calculator-assumed. Most candidates were able to access all of the questions. The mean for Section One was higher than the mean for Section Two, and the difference between the section means was much larger than it was for the 2022 examination (6.78% difference). The mean score of 64.18% was 1.25% lower than in 2022.

Attempted by 3608 candidates	Mean 64.18%	Max 100.00%	Min 0.00%
Section means were:			
Section One: Calculator-free	Mean 68.59%		
Attempted by 3607 candidates	Mean 24.01(/35)	Max 35.00	Min 0.00
Section Two: Calculator-assumed	Mean 61.81%		
Attempted by 3608 candidates	Mean 40.18(/65)	Max 65.00	Min 0.00

General comments

Candidates generally performed well in the examination. There appeared to be a few specific areas of content weakness, however candidates did well across most questions that were calculation based. Questions requiring an explanation or a conclusion/decision to be drawn presented more of a challenge.

Advice for candidates

- Read questions carefully.
- Include appropriate units in responses to questions involving a context/application.
- Take care in neatly setting out your reasoning and use correct notation. This will help you to organise your thoughts and minimise the chances of errors. It also makes it easier for markers to understand what you are doing and to award marks appropriately.
- Ensure that you do not skip steps in questions asking you to ‘show’ a result.

- When sketching functions, show key features in the correct locations.

Advice for teachers

- Focus on the distinction between probability distributions/density functions and cumulative distributions/density functions for both discrete and continuous random variables.
- More emphasis should be placed on the interpretation of a logarithmic scale.
- Remind students that the second derivative test is inconclusive for critical points when $y'' = 0$. In such instances they need to use the sign test.
- Re-enforce to students the need to use $p = 0.5$ (worst case scenario) when asked to determine the sample size so that the confidence interval will have a margin of error less than a prescribed level.
- Remind students that responses to bias questions need to include the source of bias and an explanation that clearly outlines why some group within the population is more or less likely to be included in the sample than another group. The explanation must be context specific.
- Ensure that students are familiar with syllabus terminology, for example ‘signed area’.
- Re-enforce to students that when they are asked to make a decision based on a confidence interval, they need to state a conclusion based on whether or not the claimed value is within the confidence interval. They should not avoid a decision by stating that they cannot be 100% certain. It is important to understand that not all 90% confidence intervals, for example, will contain the true population proportion, however that is not the point of questions asking for a decision based on that confidence interval. When a decision is made based on a 90% confidence interval it is understood that the result is not a certainty.

Comments on specific sections and questions

Section One: Calculator-free (53 Marks)

Candidates generally performed well in this section, with the majority of questions answered by most of the candidates. Some notable areas of weakness related to the reading of a log scale, the application of the second derivative test, understanding the distinction between cumulative and individual probabilities, and showing attention to detail when sketching a function.

Section Two: Calculator-assumed (96 Marks)

Candidates found this section more challenging than Section One. The main areas of weakness were in explaining sources of bias, misunderstanding the term ‘signed area’ and its connection to change in displacement, not showing clear working/reasoning and not using correct notation (e.g. dt at the end of an integral), not including units in answers to applied questions, not distinguishing between cumulative density functions and probability density functions, and not drawing correct conclusions based on confidence intervals.