

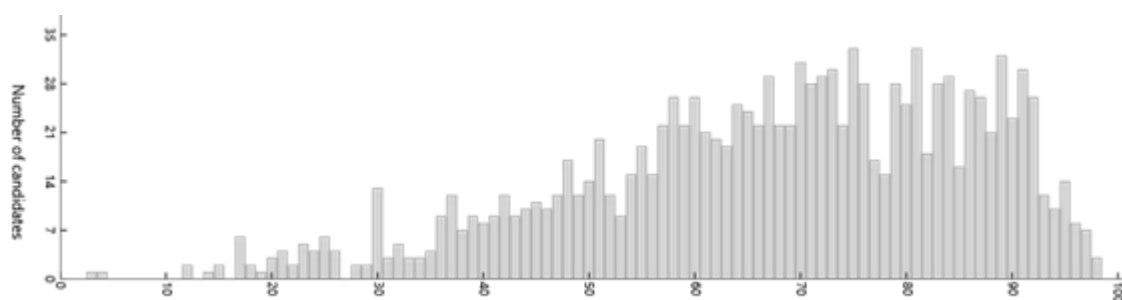


Summary report of the 2024 ATAR course examination report: **Mathematics Specialist**

Year	Number who sat	Number of absentees
2024	1279	15
2023	1297	18
2022	1350	28
2021	1503	18

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. The mean for Section Two was lower than the mean for Section One.

Attempted by 1279 candidates Mean 67.21% Max 98.47% Min 2.98%

Section means were:

Section One: Calculator-free	Mean 73.90%		
Attempted by 1279 candidates	Mean 25.87(/35)	Max 35.00	Min 0.74
Section Two: Calculator-assumed	Mean 63.61%		
Attempted by 1278 candidates	Mean 41.35(/65)	Max 63.47	Min 0.00

General comments

Candidates generally found many aspects of the examination accessible as indicated by the high mean. Despite this, algebraic skills were poorly demonstrated by many candidates, particularly in applying the distributive property correctly (Questions 3 and 7 part (b)) and in obtaining the correct numerator expression when working with partial fractions (Question 4 part (a)).

The standard deviation of 18.62 indicated that the examination provided a good level of discrimination across the range of candidate abilities. In particular, Questions 2 part (b), 8 part (e), 16 part (c) and 18 part (e) discriminated well among candidates.

The length of the Calculator-free section of the paper allowed candidates to review their initial answers and to go back and change their answers as seen by the frequent use of the spare pages in this section. The Calculator-assumed section provided a tighter timeframe to work, however, the last question still had high participation rates.

Advice for candidates

- Check your working out from one line to another to ensure that work is copied correctly.
- Ensure that working out is logically sequenced and has a clear conclusion.
- Digits and explanations need to be written legibly.
- Do not use the word 'it' in any written answers. Ensure answers are precise and not ambiguous.

Advice for teachers

- Strengthen students' general command of algebraic processes.
- Provide opportunities to visualise three dimensional vectors using computer software to improve conceptual understanding.
- Provide opportunities for students to explain ideas in written form and verbally so that correct mathematics vocabulary can be practised.

Comments on specific sections and questions

Section One: Calculator-free (47 Marks)

Candidates performed very well in:

- evaluating a definite integral using a given substitution (Question 3)
- anti-differentiating using partial fractions (Question 4)
- identifying properties of a given rational function (Question 5)
- solving the complex polynomial equation (Question 7).

Areas where candidates experienced difficulty were:

- determining the domain of a composite function (Question 2 part (a))
- describing the geometric significance of the solution of simultaneous equations (Question 6 part (c))
- expanding correctly using the distributive property (Question 7 part (b)).

Section Two: Calculator-assumed (85 Marks)

Candidates performed well in:

- recognising the differential equation for simple harmonic motion (Question 12 parts (a) and (b))
- recognising the sample mean being normally distributed and constructing a confidence interval for the population mean (Question 14 parts (a) and (d))
- working with a 'non-standard' absolute value function (Question 15).

Areas where candidates experienced difficulty were:

- describing the location of roots of unity in the Argand plane (Question 9 part (c))
- the development of the expression for the volume of a solid of revolution (Question 11 part (a))
- the use of the logistic growth rate equation (Question 13 part (c))
- calculating the angle between vectors in three dimensions (Question 16 part (b)) and calculating the minimum distance between vectors in three dimensions (Question 16 part (c))
- the interpretation of a differential equation in terms of rectilinear motion (Question 17 part (b)).