

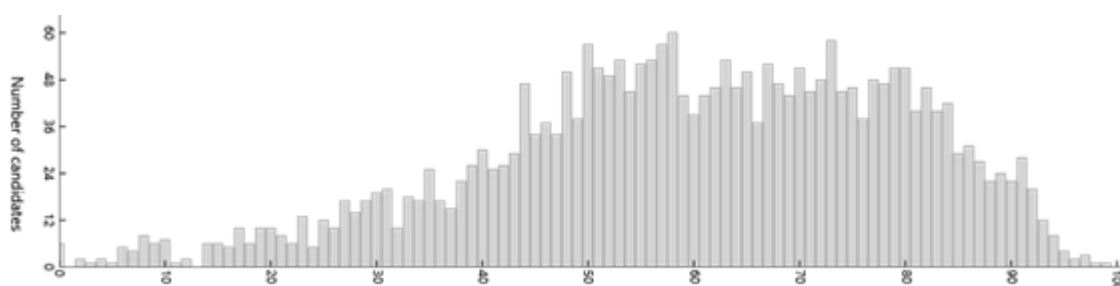


Summary report of the 2024 ATAR course examination report: Physics

Year	Number who sat	Number of absentees
2024	2648	35
2023	2410	35
2022	2545	51
2021	2680	43

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 mean was 59.82%. The high standard deviation (over 19%) was related to the large disparity among candidates. The paper consisted of questions that ranged in terms of difficulty, topic and what the candidates were asked to do, i.e. calculate, draw, explain, derive or describe. For a variety of reasons, the explanation questions proved to be the hardest with even straight-forward answers being inadequately expressed or incomplete. Handwriting was a concern with some answers being illegible. The paper provided ample opportunity for candidates to demonstrate their knowledge of Physics. The maximum mark available was attained on all parts of every question by at least one candidate. This indicates that no question was ambiguous or inaccessible.

Attempted by 2644 candidates Mean 59.82% Max 99.49% Min 0.00%

Section means were:

Section One: Short response	Mean 62.38%		
Attempted by 2643 candidates	Mean 18.71(/30)	Max 30.00	Min 0.00
Section Two: Problem-solving	Mean 61.54%		
Attempted by 2641 candidates	Mean 30.77(/50)	Max 50.00	Min 0.00
Section Three: Comprehension	Mean 51.69%		
Attempted by 2628 candidates	Mean 10.34(/20)	Max 20.00	Min 0.00

General comments

Candidates generally performed well on one line calculations. However, in some cases, such as Question 17 part (c) they chose incorrect formulae or could not rearrange simple algebraic or trigonometric equations as in Question 13 parts (a) and (b) to isolate the variable required. Questions that required candidates to express themselves or derive expressions without numbers such as Question 3 proved difficult. Candidates' use of significant figures was limited to questions where the number of significant figures was

stated in the question or the instructions to candidates page. Candidates were not able to apply their knowledge of significant figures in answering Question 10. Very few candidates realised the equation given in Question 16 was in the form of $y = mx + c$ and therefore could not identify the y-axis intercept or the gradient of the line of best fit. Many sought to simply change the equation incorrectly into a more familiar form. This lack of understanding of first principles is of concern.

Advice for candidates

- Practise answering explanation questions.
- Get back to basics e.g. Trig functions, algebraic manipulation, significant figures and some common definitions (e.g. What is a black body?)
- Lay your answers out in a logical sequential way. Cross out incorrect answers.
- Use correct punctuation.
- Read the entire passage in the comprehension section. Do not skim read and look at the diagrams. Do not read the questions first and then go looking for the answers.
- Not all data processing questions are alike. Try to visualise your graph before drawing it.

Advice for teachers

- Give students the opportunity to use error in calculations based on real measurements.
- Encourage students to use more effective ways when laying out an answer.
- Instruct students that significant figures are important when dealing with measurements not just for questions that state the required number.

Comments on specific sections and questions

Section One: Short response (55 Marks)

Section One had a mixture of short answer, multiple part questions and longer calculations and derivations. Questions 3 and 10 had two of the lower means in the section. This shows they were considered difficult yet they had the highest correlation with the section total. Simple two-choice questions such as Question 9 (a) had a negative correlation.

Section Two: Problem-solving (96 Marks)

This section comprised multi-step questions where candidates are asked to perform a variety of tasks on the same topic and context. For those questions requiring a written explanation, candidates were better showing their understanding through calculations rather than through written explanations. Relativity is now well-understood as Question 14 produced the highest mean of any question in this section. The data processing question was slightly different in its presentation as it had a y-intercept which was crucial to an understanding of the context. It was clear that a large number of candidates did not understand that the mass of the piece of wood would cause tension even without any added masses therefore a value of 0 kg added still had a tension reading on the y-axis. Many candidates did not appreciate tension was expressed in the form of a straight line equation. Many candidates were well-versed at 'going through the motions' of data processing without understanding why or how.

Section Three: Comprehension (39 Marks)

Performance in Section Three was lower than in the other two sections.