IMTA Observations on SEC Exam Papers 2025

Introduction

The Irish Mathematics Teachers' Association (IMTA) welcomes the opportunity to share our observations on the 2025 State Examinations in Mathematics. Overall, we commend the efforts of the State Examinations Commission in designing exams that allow students to demonstrate their learning across a range of levels and abilities. Across the eight Mathematics papers examined — Leaving Certificate Higher Level Papers 1 and 2, Ordinary Level Papers 1 and 2, Foundation Level, Leaving Certificate Applied (LCA) Mathematical Applications, and Junior Cycle Higher and Ordinary Level papers — there was a great deal of thoughtful structuring and many examples of clear, fair assessment.

However, our observations have also highlighted the need for a consistent approach in supporting students across all levels and papers. For instance, where certain papers incorporated bolded key words, terms, and units — a practice that many teachers and students found very helpful in guiding focus and aiding comprehension — we strongly recommend that this be standardised across all exam papers. Similarly, while the papers did provide extra pages at the back of the script for workings (although only 1 page on Paper 2), many students have expressed that these spaces are often overlooked or simply not practical during timed exams. To better support students in working through multi-step problems, we strongly suggest that all questions be allocated sufficient working space directly beneath or beside the question, especially in higher-level assessments.

Another key area we highlight is the need to allow students the freedom to "mess around" with problems and explore different approaches. When questions are overly prescriptive — for example, by telling students exactly which method to use (as with the explicit hints like "use the sine rule" or "use the cosine rule" in Leaving Certificate Higher Level papers) — it can limit their problem-solving flexibility and stifle genuine mathematical exploration. We believe that part of mathematical education is giving students the time and freedom to try out different approaches, see what works, and build deeper conceptual understanding. More open-ended questions and flexible marking would better support this authentic learning experience.

We hope that these observations, both affirming and constructive, will help to further refine and strengthen the design of future state examinations, supporting students to achieve their best while ensuring fairness, clarity, and genuine opportunities for mathematical thinking at every level.

Leaving Certificate Higher Level Paper 1

The IMTA welcomes the overall presentation and layout of **LC HL Paper 1** in 2025. The paper was well laid out, offering ample space for workings. The consistent use of prompts and bolded keywords, terms, and units across most sections was highly beneficial for students. Each question was fair and balanced, incorporating both accessible and more challenging components as it progressed. Section A questions were concise, well-structured, and focused on specific, discrete topics. The extended questions in Section B were consistently appropriate, with some blending of topics; however, they remained fair. While the presence of sequences and series was a notable feature of the paper, the paper still provided sufficient choice for students who had prepared their course material thoroughly.

While the wording in Section A was commendably clear and concise, the phrasing and units in Section B may have impeded students' problem-solving pace. This may have been an intentional aspect of the assessment. The sentence describing "the proportion of points... of the sequence" in Question 10 was superfluous and may have caused students to waste valuable time analysing its relevance, even though subsequent questions were straightforward and independent of this information. The units in Question 9 were also very cumbersome, potentially leading students to overthink their importance.

A minor point of concern arose in Question 10(c), where the instruction not to draw on the diagram in part (a) could pose difficulties for some students. A final concern pertains to the marking scheme: papers featuring relatively straightforward sections often employ a stringent marking approach for more challenging parts. We advocate for a fair and balanced marking scheme to ensure students are not unduly penalised.

Specific Observations:

- **Q2(b)(i)**: The nuance of slope at the point where $x = 3$ will have escaped most students.
- **Q4(c)**: May have looked unfamiliar to unprepared students but was fair with only two roots required. However, if an equation is going to have six roots, students should be provided with more room to answer, even if they only need to find two roots.
- **Q5(c)**: Required students to stop and think but was ultimately a reasonable question.
- **Q7**: Strangely worded but fair in general.
- **Q8(e)(iii)**: The most challenging part of Q8, but it was very scaffolded. If a scale is necessary to answer the question, it would have been useful to provide a scale on the diagram, or at least boxes/grid.
- **Q9**: The units from part (c) onwards were cumbersome and could have led to confusion.
- **Q10(c)**: If students cannot reuse the graph from part (a), they should have been given a second diagram. We want problem solvers, so we shouldn't limit their tools for solving the problem.
- **Q10(d)**: Contained superfluous wording at the top-of-page and not relevant to students, potentially causing confusion.
- **Q10(e)**: An unusual presentation of an induction question, but not unfair.

Summary:

- Overall, this was a well-structured and balanced paper with a good range of accessible and challenging material.
- Some isolated issues with the clarity of units and phrasing in certain questions.
- We commend the clear presentation of Section A and the opportunity for all students to showcase their learning.
- We encourage the SEC to consider more explicit guidance for markers to ensure a balanced approach in the marking scheme, especially in questions with potential for misinterpretation.

Leaving Certificate Higher Level Paper 2

Leaving Certificate Higher Level Paper 2 presented a well-rounded but challenging examination, incorporating a diverse range of expected topics including the line, circle, trigonometry, geometry, probability, statistics, and area and volume. The paper included several readily accessible short questions, and significant portions of the longer questions were also quite approachable. These accessible elements were balanced with more demanding sections in both the short and long question formats.

The paper was very well laid out with sufficient space for workings. Like Paper 1, the continued use of prompts and the bolding of key words, terms, and units in most sections was both welcomed and helpful for students. Questions 1 through 4 were familiar, clear, and fair, which should have helped students feel comfortable and ready for the more engaging and challenging questions that followed. Although Question 5(b)(ii) asked students to think critically, it was a short question, and students should have had enough time to complete it. Questions 7 and 8 were carefully built up step-by-step, giving students the best possible chance to succeed.

The distinct use of letters (A, B, C versus P, Q, R) in Question 4 enhanced clarity and prevented ambiguity. However, the re-use of A, B, C in unrelated Question 8(b) was a potential source of confusion that could have been avoided. Similarly, in Question 10, the assignment of specific letters (X, Y, Z) to variables for subsequent calculations of means and z-scores was also unnecessary and could have been streamlined. In Question 9(a), the extensive word count and the interchangeable use of "proportion," "probability," and "percentages" may have introduced ambiguity in an otherwise straightforward section. For Question 10(d), while students are expected to define stratified sampling, the requirement to explain “How to take as a stratified random sample” represents a skillset that may not be routinely emphasised or practised in classroom settings. We recommend that marking for this question reflect this potential disparity in student preparation.

Specific Observations:

- **Q6(b)**: This part was seen as very unfair. Modulus of trigonometric functions was not something seen before — is it even on the syllabus? While the range was fine, the period was not easy.
- **Q9(a)**: Wording is cumbersome.
- **Q9(c)(ii) & (d)**: Will challenge most students; an unusual question.
- **Q10(d)**: May be a question students will be uncertain about.

Summary:

- Overall, this was a carefully balanced paper that provided fair opportunities for students to demonstrate their knowledge, while also challenging them to apply their understanding in new contexts.
- A few wording and clarity concerns could be revisited in future papers to further support student understanding.

Leaving Certificate Ordinary Level Paper 1

Leaving Certificate Ordinary Level Paper 1 included a range of straightforward, accessible questions balanced by others that demanded conceptual understanding and flexibility. Many questions incorporated multiple topics, requiring students to integrate their learning, though very little calculus appeared overall. Standard complex number questions appeared as expected.

While the overall paper was fair, it was noted that some questions were very wordy and could have been simplified. Using bold font for key terms and breaking long paragraphs into separate sections would have helped students navigate the text more effectively. At times, the paper jumped between topics without clear progression, forcing students to set up entirely new scenarios mid-question rather than building upon previous parts. Financial Maths was sprinkled across several questions as short sections, where it might have been clearer to group it together.

Specific Observations:

- **Q1(b)(ii)**: Multiple acceptable approaches: students could either use the (i) value and multiply by 5, or calculate the sum of each person's rate of windows/min and then divide 35 by this rate.
- **Q3(b)**: Does not explicitly ask for a number-line, so one should not be required.
- **Q3(c)(i)**: May confuse students due to its open-ended nature.
- **Q4(c)**: Requires strong conceptual understanding of the derivative.
- **Q5(c)**: Very easy and in (ii), students should be able to select the midpoint of two roots without workings, but some may form a quadratic and use calculus, so h'(x)=0 is a "WOM" (way of working). Part (c) is essentially a tick-the-box question, identifying the midpoint on a number-line.
- **Q7(b)**: Unnecessarily wordy; while it tries to help students, the volume of text will hinder some. Paragraph spacing would help.
- **Q7(d)(ii)**: Students may connect each point with lines (as in the previous graph) or use a smooth curve (since it's exponential). Both should be accepted.
- **Q7(e)(i)**: Students may struggle with this part. In (ii), wording is unclear about whether students should interpret "n" as total months from January or as months after July. Both interpretations (24 months total or n) should be accepted.
- **Q8**: Very wordy in definitions for variables; bold font would help. Answers will vary: some students will give P(x) in millions of euro, others will not, and x in phones or tens of thousands of phones. Graph scaling was inconsistent. Part (c)(i) will be poorly answered as R(2)+3 is likely to throw students; it would have been better to introduce R(2) first and then add the 3 million in funding.
- **Q9(b)**: Some students may draw the pattern underneath Pattern 3 instead of in the box, so the whole page must be checked.
- **Q10(i)**: Drawing a net is unusual for LC exams and should have been highlighted in bold.
- **Q10(b)** and **Q10(c)**: Very wordy, no bold font to guide students, and definitions of each variable should have been on separate lines for clarity.

Summary:

- Overall, while containing standard and familiar questions, the paper's unnecessary wordiness and sudden topic changes could have posed a significant challenge for students' comprehension and focus.
- We recommend clearer, more concise wording, more consistent scaling on graphs, and more visual cues (such as bold font and spacing) in future papers to support student understanding.

Leaving Certificate Ordinary Level Paper 2

Leaving Certificate Ordinary Level Paper 2 was overall a straightforward paper that offered good options across different topics and blended topic questions. The paper was not overly wordy and included multiple entry points and lead-in questions, making it more accessible for students who may have found the higher-level questions challenging.

While generally clear and balanced, there were a couple of issues to note. Question 9 featured diagrams that were not helpful and may have confused some students. There were also a few instances where the paper could have explicitly stated the number of decimal places expected, providing clearer guidance for students. Question 4, focusing on the line, may have been tricky for some students but was not unfairly challenging.

Summary:

- A generally well-structured paper with clear layout and accessible questions.
- A few minor clarity issues, particularly around diagram clarity and explicit guidance on decimal places.
- We recommend continued attention to diagram quality and explicit instructions on precision to support students in future papers.

We are very happy with the design and delivery of both the **Leaving Certificate Applied** (LCA) Mathematics and the **Foundation Level Leaving Certificate Mathematics** examinations. Teachers and students alike have shared very positive feedback, noting that these exams were clearly laid out, well-scaffolded, and inclusive of a broad range of topics and skills. The LCA paper in particular was seen as a fair reflection of the course's practical and applied focus, providing ample opportunity for students to demonstrate their understanding in accessible, real-world contexts.

Similarly, the Foundation Level paper offered students a well-structured, supportive exam experience. It was well-pitched to help students succeed, balancing straightforward questions with a few more challenging ones to stretch their thinking. Teachers have commended how these papers considered the diverse needs and abilities of Foundation Level learners. Overall, both exams provided a fair, balanced, and supportive opportunity for students to showcase their learning, which is exactly what we hope to see at these levels.

Junior Cycle Higher Level

Regarding the overly easy nature of the Junior Cycle Higher Level examination, we feel this paper does not adequately prepare students for the challenges of mathematics at senior cycle. While some difficult elements were included, they were few and far between, and the overall tone of the exam was notably undemanding. This will inevitably distort the distribution of results, giving students a misleading impression of their abilities in mathematics. More worryingly, it may lead students to mistakenly believe that Higher Level Maths at Leaving Certificate will be similarly accessible, which is not the case. We urge that future Junior Cycle Higher Level papers be carefully calibrated to ensure they genuinely reflect the standard required for successful progression to Senior Cycle, including a balanced mix of accessible and challenging content that fosters deep understanding and problem-solving skills.

- With only one paper now and a large syllabus, there is only so much that can be asked. It was unfair to ask two translation questions in Question 5, disadvantaging students not strong in this topic.
- **Q6(c)**: parallel lines not marked on both diagrams. No units given for (c) and no guidance on how to write the answer as it was a recurring decimal.

Junior Cycle Ordinary Level

- The Junior Cycle Ordinary Level paper was a very nice and approachable exam that assessed core skills and understanding as outlined by the specification. Its structure was similar to previous years, which likely gave students confidence in answering the exam. There were some very nice algebra questions, with Question 7 in particular providing a clear assessment of algebra skills without overwhelming students with notation. Much of the exam focused on practical maths that students will use in their everyday life.
- However, the paper was very wordy at times, which would have made certain questions difficult to access for students with literacy difficulties. This was particularly evident in Questions 2 and 6. Question 10 was noted as a harder algebra question than what was seen on the Higher Level paper, and Question 14 was also harder than the coordinate geometry typically assessed at HL. There was a notable lack of geometry and no constructions included in this year's paper.
- Q1: same as previous years. Very nice to ease them in.
- Q2: Students needed good comprehension skills to grasp what was happening. Some might over look key fact that 13.40 is the change not the cost of the bars.
- Q3: Wording of part c was of a LC question standard "greatest possible...less than"
- Q6: Pictures might throw some students off
- (b) not out of place on LC paper. Quite tough for some.
- Q7: Picture based sim equations is nice but introducing for the first time in an exam setting less than ideal! However overall Q7 was in line with the new algebra skills at primary
- Q9: Part (a) talks about the bank account. Part (b) talks about a different savings account and part (c) talks about Credit Unions - could confuse students. This needed good reading comprehension skills.

- Q11: Bit all over the place. Very back and forth. Very challenging and not very easy to read as a teacher! Not clear if students had to measure the boxes with a ruler or assume each box was 1cm? LC HL were explicitly told to **measure**!
- Q13: Unit changes required not in bold? At LC HL unit changes are highlighted in bold. Why is the same scaffolding not provided here?

The standard of questions was in line with the OL specification and similar to other assessments in previous years. However, the exam overall seemed to be set at a higher standard than the HL paper, particularly in areas such as algebra, coordinate geometry, and financial maths. In places, the questions asked on the OL paper were much more challenging.