

Report on Investigation Re-assessment
Senior Mathematics Curriculum and Methodology B

Having taken over the Stage 2 Mathematical Methods class, I have re-marked the student's last investigation at your request in order to confirm the results. Below are my findings and reasonings:

Concepts and Techniques

CT1 - Knowledge and understanding of concepts and relationships.

Graded in the A band. Was able to effectively use their understandings of functions, algebra, and derivatives to successfully complete the task.

CT2 - Selection and application of mathematical techniques and algorithms to find solutions to problems in a variety of contexts.

Graded in the A band, as a variety of techniques were required to design the ten different types of functions used so that they transitioned smoothly.

CT3 - Application of mathematical models.

Graded in the A band. By using ten different functions, including five non-polynomial functions, they were successfully able to develop a smoothly transitioning series of functions to represent a rollercoaster as required by the task.

CT4 - Use of electronic technology to find solutions to mathematical problems.

Graded in the A band. The described intention to use technology in the introduction was effectively demonstrated throughout the investigation. 24 out of the 27 figures seen in the investigation are made using Desmos, used to both explain concepts and display solutions. Good use of their calculator is shown in solving simultaneous equations when working with cubic functions, seen in sections 3, 12, 16, and 19.

Reasoning and Communication

RC1 - Interpretation of mathematical results.

This has been graded in the B band as "mostly appropriate interpretation", based on how each section is introduced. In some sections (5, 10, 13, 14, 17, 18) contain good detail on the benefit of the functions in reference to the problem of the rollercoaster, with some extra discussion in the conclusion, but this is not followed through all sections to be regarded "comprehensive".

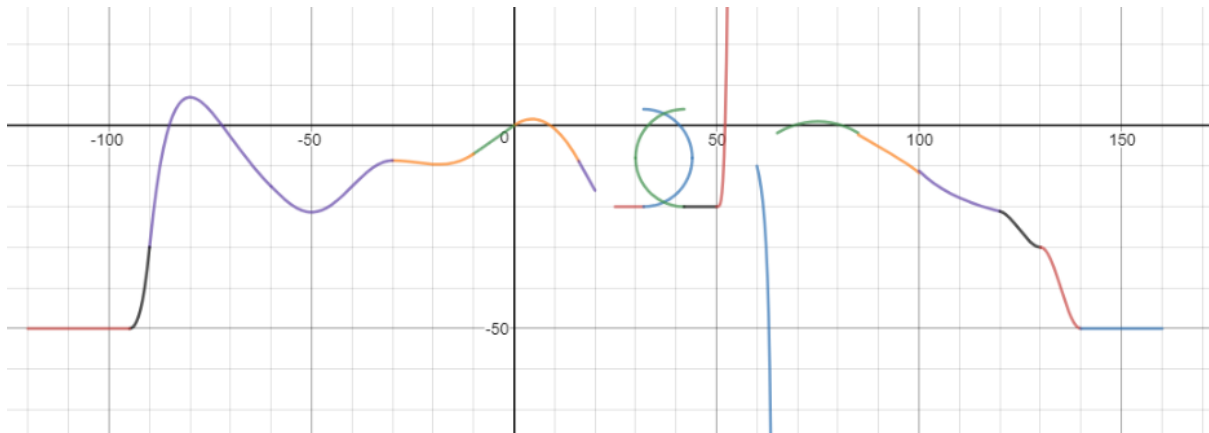
RC2 - Drawing conclusions from mathematical results, with an understanding of their reasonableness and limitations.

This has been graded in the B band based on conclusion found on page 17. Referencing the teacher's comment on the conclusion, while some good conclusions and discussion of reasonableness has been made, by missing some of those more basic points in relation to the bulk of the work done doesn't demonstrate a comprehensive understanding of those limitations.

RC3 - Use of appropriate mathematical notation, representations, and terminology.

This has been graded in the B band, down from the A of the original marking. The change of "proficient" to "mostly" is due to the number of mistakes in accurately communicating their findings. Graphing the summarised functions on page 16, the following is seen:

Report on Investigation Re-assessment
Senior Mathematics Curriculum and Methodology B



This is in comparison to the provided graph:

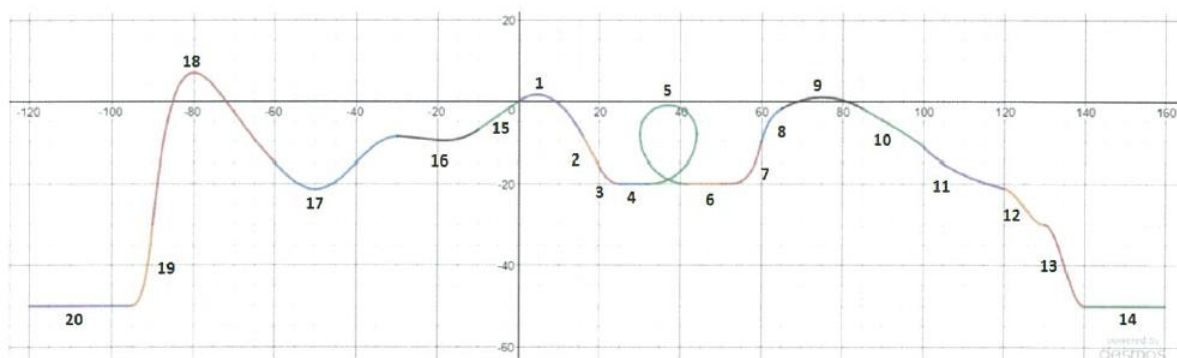


Figure 27. Roller Coaster Track

In each case, the error is small, typically a sign error either in the bound (segments 4 and 6), or in the formula (segment 8). Segment 7 was missing an x , and segment 10 does not actually line up with the start of segment 11. While clearly they were able to graph the functions correctly, these errors were not fixed in the work, and the error is consistent through its relevant section, and in the summary. These inconsistencies are sufficient to drop it to the lower band.

RC4 - Communication of mathematical ideas and reasoning to develop logical arguments.

Graded in the B band due to a lack of consistency. Most sections were well explained, showing how functions worked, and how they were selected and used, but not in all cases (see notes on pages 4, 8-10).

RC5 - Development, testing, and proof of valid conjectures.

As conjectures did not feature in the task description of the investigation, this feature was not assessed against the performance standards for this task.

Conclusion

The only change to the assessment of the performance standards was in RC3, due to mistakes in the communication of results that were not found by the previous marker. With Concepts and Techniques all being found in the A band, and all of Reasoning and Communication being found in the B band, a decision has to be made on whether the grade should remain at an A- or be lowered to a B+. When compared to a benchmarked example of a B-, it shares some of the same problems in RC1 and RC2, but does generally better on communication of results, and in use of technology. Without comparison to further benchmarked examples, I would err on the side of confirming the result rather than lowering it to a B+.

Jeremy Hughes
(a1646624)