

## Example 48: Path of violin bow frog

**Subject:** Mathematics: analysis and approaches and mathematics: applications and interpretation

**Paper component:** Internal assessment, standard level (SL) and higher level (HL)

### Assessment

Criterion	A	B	C	D	E (SL)	E (HL)	Total (SL)	Total (HL)
Achievement level awarded	3	4	3	2	6	5	18	17
Maximum possible achievement level	4	4	3	3	6	6	20	20

### Comments

Criterion	Comments
A Presentation	The exploration is well written, and is concise given its complexity. It is mostly coherent but in some passages it is difficult to follow. It is also a well-organized piece of work. A2 is too harsh and A4 too generous so “best fit” was used to award A3.
B Mathematical communication	The exploration has abundant forms of appropriate mathematical communication. The candidate demonstrates an excellent command of mathematical notation. There is excellent and appropriate use of relevant and different forms of mathematical representation, which is also consistent. All tables and plots are correctly labelled.
C Personal engagement	The candidate’s voice can be heard throughout the exploration. The problem is approached from different perspectives. The work is insightful, with the candidate continually exploring the best way to model the path of the bow.
D Reflection	There were times where the candidate could possibly have been more analytical; however, overall they reflected meaningfully at each step and this helped move the exploration to the next stage. On page 10 reflection on best fit is not justified quantitatively. There are also missed opportunities to reflect on figure 9 on page 11. On page 13 the candidate claims that an error of 7.5% is small and validates the model. This claim would need justification by a goodness of fit (GOF) analysis.
E Use of mathematics SL	
E Use of mathematics HL	This exploration shows that less can be more in the mathematics internal assessment. The candidate uses mathematics that is commensurate with the course in a very sophisticated way, but showing thorough understanding throughout. The error on pages 6 and 7 precludes the work from being precise.
General comments	This is an example that shows how a candidate need not go beyond the syllabus content to produce an excellent piece of work that deserves high levels in criterion E.