

Diploma Programme subject in which this extended essay is registered: Mathematics

(For an extended essay in the area of languages, state the language and whether it is group 1 or group 2.)

Title of the extended essay: Fractional Differentials And Their Basic
Applications (Fractional Calculus)

Candidate's declaration

If this declaration is not signed by the candidate the extended essay will not be assessed.

The extended essay I am submitting is my own work (apart from guidance allowed by the International Baccalaureate).

I have acknowledged each use of the words, graphics or ideas of another person, whether written, oral or visual.

I am aware that the word limit for all extended essays is 4000 words and that examiners are not required to read beyond this limit.

This is the final version of my extended essay.

Candidate's signature: _____

Date: 20 Jan
2009

Supervisor's report

The supervisor must complete the report below and then give the final version of the extended essay, with this cover attached, to the Diploma Programme coordinator. The supervisor must sign this report; otherwise the extended essay will not be assessed and may be returned to the school.

Name of supervisor (CAPITAL letters) _____

Comments

Please comment, as appropriate, on the candidate's performance, the context in which the candidate undertook the research for the extended essay, any difficulties encountered and how these were overcome (see page 13 of the extended essay guide). The concluding interview (viva voce) may provide useful information. These comments can help the examiner award a level for criterion K (holistic judgment). Do not comment on any adverse personal circumstances that may have affected the candidate. If the amount of time spent with the candidate was zero, you must explain this, in particular how it was then possible to authenticate the essay as the candidate's own work. You may attach an additional sheet if there is insufficient space here.

has chosen this topic on his own initiative, after having read one of my research articles. He worked in an independent manner and managed not only to understand the topic but also to find very interesting applications of Practical Calculus, like Shadow on the walls. Moreover, while working on his EE, this young man became so fond of the topic, that he changed his career plans and will study mathematics in college. This is a dream of any maths teacher. I think this work is of a good quality and done with passion. A good example of a really mathematical Extended Essay. His methods of reasoning, presentation and analysis are impressive.

I have read the final version of the extended essay that will be submitted to the examiner.

To the best of my knowledge, the extended essay is the authentic work of the candidate.

I spent 3 hours with the candidate discussing the progress of the extended essay.

Supervisor's signature: _____

Date: 20.07.09
Minneapolis - 297/379

Assessment form (for examiner use only)

Candidate session number	0	0	
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Assessment criteria		Achievement level		
		First examiner	maximum	Second examiner
A	research question	2 ✓	2 ✓	1 ✓
B	introduction	2 ✓	2 ✓	2 ✓
C	investigation	4 ✓	4 ✓	3 ✓
D	knowledge and understanding	4 ✓	4 ✓	2 ✓
E	reasoned argument	4 ✓	4 ✓	3 ✓
F	analysis and evaluation	4 ✓	4 ✓	2 ✓
G	use of subject language	3 ✓	4 ✓	3 ✓
H	conclusion	2 ✓	2 ✓	1 ✓
I	formal presentation	3 ✓	4 ✓	3 ✓
J	abstract	2 ✓	2 ✓	2 ✓
K	holistic judgment	4 ✓	4 ✓	3 ✓
Total out of 36		34 ✓		25 ✓

Name of first examiner: _____
(CAPITAL letters)

Examiner number: _____

Name of second examiner: _____
(CAPITAL letters)

Examiner number: _____