SF2719/SF2725 The History of Mathematics
Exam
Monday, December 17, 2018

Time: 14:00–19:00
Allowed aids: Swedish-English and/or English-Swedish dictionary
Lecturer: Tilman Bauer
Examiner: Tilman Bauer

This exam consists of three parts, each giving up to 12 points. The grade requirements are:

	E	D	C	B	A
minimum points	18	21	24	27	30
of which on part A at least	4	4	4	4	4
and on part B at least	4	4	4	8	10
and on part C at least	4	4	4	8	10

Students achieving at least 4 points on every part, but only 16 or 17 points in total, obtain the grade Fx with the possibility of completion to grade E.

PART A

Answer the following questions briefly. Every question gives up to 2 points. Questions 1 through 4 can be replaced by the in-class quizzes 1 through 4, respectively. If you answer one of these question and at the same time got points on the corresponding quiz, the maximum score will be taken.

1. Which Greek mathematician studied integer solutions of equations, and when did he live?

2. Describe the geometric method of "completing the square."

3. What problem led Newton to consider power series? Around what time did this happen?

4. Which new branch of algebra did Galois invent as a byproduct of his study of solutions of polynomial equations? Around what time did this happen?

5. Name three mathematicians involved in the development of probability theory in the 17th century, along with the contributions they made.

6. For a long time, geometry was used to solve algebraic problems. At some point in history, the reverse path became viable. Around what time did this happen? Name an important mathematician associated with this development.

This part consists of an analysis of an original text (or a translation thereof). Your bonus points from the homework essays 1 and 3 are added to the score achieved on this part. However, the total score cannot exceed 12.

7. Analyze the following translation with respect to the questions:

- What is the purpose of this text?
- What mathematical content does it advertise, and what is the significance of that content?

Seeing there is nothing (right well beloved students in the Mathematics) that is so troublesome to Mathematicall practise, nor that doth more molest and hinder Calculators, than the Multiplications, Divisions, square and cubical Extractions of great numbers, which besides the tedious expence of time, are for the most part subject to many slippery errors. I began therefore to consider in my minde, by what certaine and ready Art I might remove those hindrances. And having thought upon many things to this purpose, I found at length some excellent briefe rules to be treated of (perhaps) hereafter. But amongst all, none more profitable than this, which together with the hard and tedious Multiplications, Divisions, and Extractions of rootes, doth also cast away from the worke it selfe, even the very numbers themselves that are to be multiplied, divided and resolved into rootes, and putteth other numbers in their place, which performe as much as they can do, onely by Addition and Subtraction, Division by two or Division by three; which secret invention, being (as all other good things are) so much the better as it shall be the more common; I thought good heretofore to set forth in Latine for the publique use of Mathematicians. But now some of our Countrymen in this Island well affected to these studies, and the more publique good, procured a most learned Mathematician to translate the same into our vulgar English tongue, who after he had finished it sent the coppy of it to me, to be seene and considered on by myself. I having most willingly and gladly done the same, finde it to be most exact and precisely conformable to my minde and the originall. Therefore it may please you who are inclined to these studies, to receive it from me and the Translator, with as much good will as we recommend it unto you. Fare yee well.

This part consists of an essay. It can be replaced by the accumulated points of homework essays 2 and 4. If you write an essay here and at the same time have points from homework essays 2 and/or 4, the maximum score will be taken.

Choose **one** of the following topics and treat it in an essay. The discussion of each topic must be based on or illustrated by concrete and specific examples.

8. Is mathematics a young person's game? Discuss possible reasons for your answer.

OR

9. Describe and assess some of Fermat's contributions to 17th century mathematics.

OR

10. Describe some of the ways mathematical ideas have been disseminated.