Mathematics 446—The history of mathematics—Fall 2003

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My home page: http://www.math.ubc.ca/~cass
Course page: http://www.math.ubc.ca/~cass/courses/m446-03b/

Who may take this course? The formal prerequistes for this course include 27 credits of mathematics courses. I am going to insist on this strictly, since if you don't know much mathematics the history of the subject is pointless. The only exceptions I will allow into the course are students who have an average of 65 or better in their mathematics courses during the academic year 2002–2003.

Text: None. But there will be much reading material from various sources, mostly available on the Internet.

In addition, I will make up and hand out lecture notes from time to time. *Since there is no text, and since not everything important to this course is covered in the notes, it is important that you ask questions in class whenever you don't understand something.*

Examinations: There will be at least one mid-term examination as well as a final examination. I do not know dates yet. *Examination grades will be counted proportionally to the length of time allotted to the examinations.*

Assignments: Homeworks will be due roughly every week. Grades will be decreased by 5% for every day beyond the due date. In any event, if handed in too late, they might not be corrected, but just marked as done. *The homework assignments are extremely important.* Some will involve ordinary mathematics and some will be written essays. These will be graded on the basis of several criteria, particularly clarity. Essays must be neatly written or submitted electronically, and the criteria for grading will be partly neatness and grammatical correctness. They will count about 20% of the total term grade, but—more importantly—doing them is the only way you will learn what you are supposed to. I do not object to your working together, nor to your finding the solutions to problems in books. But I ask that you tell me on the assignment that you have done so. *If I find evidence of unacknowledged collaboration or of unacknowledged use of external resources, all parties involved will lose credit.*

In addition to the usual homework assignments, you will have to do a special project of some kind towards the end of the term, most likely an essay, but possibly an oral class presentation. Essay projects must be submitted electronically. *The project is the most important part of this course*, and will count *at least* 20% of your grade. Among other things, they must demonstrate that you are capable of independent reading. Details will be covered later.

The principal theme of this term will be the history of real numbers other than rational numbers—numbers like $\sqrt{2}$, e, and π.

The **first assignment** is to construct a timeline of the items in this list: Plimpton 322, Eudoxus, Euclid, Archimedes, Apollonius, Diophantus, Hypatia, Liu Hui, Proclus, Cardano, Vieta (or Viete), Stevin, Napier, Descartes, Pascal, Newton, Leibniz, Bernoulli, Euler, Lagrange, Gauss, Cauchy, Dedekind, Cantor, Hilbert. For each person in this list, write a few sentences telling (a) roughly what time he/she lived, (b) the present countries containing the place where he mostly lived, and in what city, (c) two items which characterize his importance in mathematics. For each item, give the analogous information. Write this down on ordinary paper, then assemble a time line showing roughly the dates for all of these along a simple linear scale. You may have to paste several sheets together for this.

This assignment is due next Monday, September 8, and you will be tested on the material in it at that time.

Internet access: As mentioned already, the course home page is

<div align="center">http://www.math.ubc.ca/ cass/courses/m446-03b.html</div>

Course materials will be available on line, including all handouts in either `.ps` and `.pdf` format. Most reading

material for the course can be found on the Internet. Some of the principal ones include

- Some pages of mine on the Babylonian table YBC7289 at

  http://www.math.ubc.ca/ cass/Euclid/ybc/ybc.html

- The article *Sherlock Holmes in Babylon* by R. Creighton Buck, from the **American Mathematical Monthly**. Early articles from this journal may be found at JSTOR, and located through the MathSciNet at

  http://www.ams.org/mathscinet/

  with which you should become familiar as soon as possible. To find this article, for example, enter `Buck, R. Creighton` in the entry field.

- Plato's dialogue **Meno** at

  http://classics.mit.edu/Plato/meno.html

  The part beginning with "learning is only a process of recollection" is the earliest large fragment of Greek mathematics extant.

- David Joyce's on-line edition of Euclid at

  `http://aleph0.clarku.edu/ djoyce/java/elements/Euclid.html`

- The works of Archimedes at

  `http://www.brainfly.net/html/archimed.htm`

- The article by Christopher Cullen in the August, 2002 issue of the *Notices* of the American mathematical Society:

  `http://www.ams.org/notices/200207/200207-toc.html`

- The mathematics history site at the University of St. Andrews:

  `http://www-gap.dcs.st-and.ac.uk/history/`

Others to be mentioned later on.