

Math 131: Survey of Mathematics
The Magic of Numbers
Spring 2007

Text: Edward B. Burger and Michael Starbird, *The Heart of Mathematics: An invitation to effective thinking, Second Edition*

Instructor: Susan Goldstine

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Office Hours: Monday 1:00–2:00, Wednesday 11:00–12:00, Thursday 12:30–1:30
and by appointment.

Drop-ins are welcome, as long as I happen to be free.

Course Web Page: <http://www.smcm.edu/users/sgoldstine/Math131s07.html>

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Evaluation

Creative Works (2)		40%
CW Presentation		5%
Homework		20%
Quizzes		10%
Class Participation		15%
Final Essays	Math as Metaphor Essay	5%
	Personal Statement	5%

Homework and quizzes will take place every two to three classes. Unlike in some other math classes, your homework will involve careful explanations of your answers in proper, neatly written, English sentences. I want to understand the reasoning behind your answers, and I want you to be able to explain what you are thinking to me. Homework will be graded for effort, completion, demonstration of effective thinking, and correctness. The quizzes will be based on both homework and classwork.

In addition to the regular homework and quizzes, there are less-structured creative assignments. These will be described in more detail in future handouts.

Note that class participation is a fair portion of your grade. A key part of this grade is attendance, and I expect you to attend all classes unless you have an excused absence or a documented emergency.

Course Description

“All is number.” This was the credo of the ancient cult of Pythagoras—until its adherents made the horrifying discovery that their notion of “number” left countless gaps unfilled. In this course, we will investigate the hidden secrets of numbers. Why are some numbers more special than others? Is infinity a number? Can numbers reveal the capacities and limitations of human reasoning? And just what is a number, anyway?

Course Goals

“The realm of mathematics contains some of the greatest ideas of humankind—ideas comparable to the works of Shakespeare, Plato, and Michelangelo. These mathematical ideas helped shape history, and they can add texture, beauty, and wonder to our lives.”

The Heart of Mathematics

The easiest way to summarize the goals of this course is to direct you to the *Welcome!* section of your textbook. Please read it.

In this class, you will take an active role in exploring some of the most profound ideas of mathematics. As you proceed, you will experience the full process of mathematical endeavor, complete with false starts, puzzling impasses, startling insights, glorious successes, and the inevitable discovery of new questions from old solutions.

We will cover the first three chapters of *The Heart of Mathematics*, plus supplementary materials that will be provided as the course progresses.

The classes will be divided between lectures and in-class activities with an emphasis on the latter, so be prepared for a non-passive classroom experience.

One of the great parts of this course will be discovering new ideas together. To this end, **I request that you do NOT read ahead in the book.**

Welcome to the course.