**Math 410, Spring 2013**
**Final Exam (take-home)**

**Due date**: Friday, May 17, 1:00 PM. Write up your answers and e-mail a copy to Prof. Martin (jmartin@math.ku.edu) as a Microsoft Word or PDF file.

**Rules**: Answer each question briefly — two or three sentences at most. You may refer to any notes, text, or reliable Web source. Cite the source for every answer you give. Do <u>not</u> copy and paste text (which would be plagiarism), but read the source you find and write a short answer in your own words. You may not ask any person any question.

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**(#1)** (a) Name three mathematical results of Archimedes.

(b) Name three kinds of algebra problems the Babylonians could do.

(c) Name three areas of mathematics in the Chinese *Nine Chapters on the Mathematical Art*.

**(#2)** Name at least two ancient cultures which knew about Pascal's triangle (long before Pascal).

**(#3)** The study of what sort of problems led to the notion of complex number? [Hint: it's not the problem "does $-1$ have a square root?".]

**(#4)** Briefly describe the controversy over the discovery of calculus.

**(#5)** What is an Erdős number?

**(#6)** Identify the speaker of each of the following quotes from the history of mathematics, and briefly describe what the quote is about.

(a) "If I have seen further than others, it is only by standing on the shoulders of giants."

(b) "I have discovered a truly remarkable proof of this theorem, which this margin is too small to contain."

(c) "Out of nothing I have created a strange new universe."

(d) "I do not see that the sex of the candidate is an argument against her appointment; after all, we are a university and not a bathhouse."

**(#7)** Urban legend has it that a state once tried to legislate the value of $\pi$. What actually happened?

**(#8)** Give a brief example of mathematics from the Americas before the European invasions.

**(#9)** Give a brief example of traditional mathematics from southern Africa (i.e., mathematics that is not part of European mathematics).

**(#10)** Give a brief example of mathematics on *The Simpsons*.