Math 101 Final Essay Guidelines

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First steps

1. Choose a topic or concept that we have discussed during the course that you enjoyed or found interesting.
2. Do some independent reading/research about this topic. If you need help getting started, come see me and I'll give you some appropriate references.
3. Find some other theorems that relate to the topic in question. Read them, and their proofs, to get an idea of how the topic you are interested in relates to other kinds of mathematics. Come see me if you're confused or need help with this, I'm so happy to help you understand more math!

The essay. Your essay should include the following features.

1. Start with a full mathematical explanation of the topic you have chosen. This should include definitions of main terminology, and an explanation of why this topic is important.
2. Find a theorem you like that involves your topic. State the theorem and prove it YOURSELF. Please don't copy word for word a proof you found somewhere. I have been reading student proofs for years. I promise, I'll know. You can use existing proofs as resources for developing your proof, but once you understand what the proof looks like, close your laptop and your books and write it yourself. Discuss why this theorem matters (to you, or to Math, or to someone).
3. Talk about why this topic appeals to you. What about it is interesting? How do you think this concept has improved mathematics? This is squishy. It doesn't have to be as mathematically precise as the previous items.

Presentation.

1. Your essay should be typeset using a standard mathematical typesetter. Most mathematicians prefer LaTeX, but in other fields (some applied math, statistics, mathematically adjacent fields), Microsoft Word's mathematical typesetting is also an accepted standard. If you have other preferred typesetting programs, ask me about them. See here for a nice intro to LaTeX. You are more than welcome to copy my preamble if you wish, although many nice templates are out there for the taking.
2. I believe it will be virtually impossible to complete the assigned tasks in less than 3 pages. I also believe it will be entirely unnecessary to write more than 6 pages. Officially, there is no required length.

3. You should have a bibliography indicating the sources from which you are pulling your main ideas. Unlike most people, I WILL accept Wikipedia as a source, as most of the mathematics on Wikipedia is excellent. I will NOT accept ONLY Wikipedia as a source. For the theorem you choose, you should cite the person who originally proved it, and their original paper. I highly recommend using BibTeX, as the citation code is copy-pasteable from Google Scholar.

Scoring. Scores will be assigned on a scale of 0-20 points. Roughly, this is what your score should look like.

- 20 points: Essay demonstrates well-developed understanding of concept. Mathematics is precise, symbols are clearly defined and correctly manipulated. Minimal typos.
- 16-19 points: Essay demonstrates reasonable understanding of concept. Mathematics is occasionally fuzzy; symbols not always clearly defined. Minimal typos.
- 12-15 points: Concept not clearly explained, or presented with a slightly incoherent understanding. Mathematics is often fuzzy and occasionally wrong. More than minimal typos, minimal inconsistencies.
- 8-11 points: Concept not clearly explained or is explained incoherently. Essay does not meet standards of presentation or writing guidelines. Symbols are incorrectly defined, incorrectly used, or undefined. More than minimal typos or inconsistencies.
- < 8 points: Nobody should score in this range unless they literally do not complete this assignment.