One of the central topics of this class has been writing mathematics: not just solving problems, but writing arguments that are meant to be read by other people.

The purpose of this assignment is to give you a chance to think about how to write mathematics, and make some of your own choices about how you want to do it. You'll need to pick a topic in mathematics that you've learned either from this class or from another and decide how you want to write about it; it could be a style similar to a textbook, or a "popularized" account, or something more exotic (like a novel). In the second part, you'll write one or two pages from your intended exposition.

Part 1: Planning

In the first part, you'll come up with your plan for what to write. You need to answer three questions: *what* you want to exposit, *to whom*, and *how*.

The easiest question to think about is the audience you want to write for. You should pick an audience you're familiar with (for instance, "math professors" isn't a good choice of audience), but it doesn't haven't to be an academic or mathematical audience. When thinking about how to write for a particular audience, think about how much they already know, how familiar they already are with mathematical thinking, and also what they'll find interesting or engaging. Some possible audiences (but feel free to come up with other ideas):

- Penn students. There are various audiences of Penn students to consider—students who have several math courses at Penn (but maybe not Math 203 yet) are a different audience from students who are going to take more math but haven't had a chance yet, and both are different from students who aren't planning to take any math.

- Non-students. Again, there are a number of sub-audiences. One possibility is a technical but non-academic audience (think of the target audience of magazines like Scientific American, Popular Science, Quanta, and so on). Another possibility is a less technical but still mostly college educated audience (think of magazines like Slate or the Atlantic, which occasionally publish popular science pieces). Yet another possibility is something more like a typical newspaper, where the audience isn't necessarily college educated.

- Younger students. Age matters (older high school students may be different from younger high school students, and certainly from middle school students), as do interests; for instance, high school students who are already interested in math are a very different audience from high school students who aren't.

The next question to think about is which material you want to write about. Anything we've covered in class, and any of the problems you've worked on in recitation, are a possible topic. You'll want to pick something narrow: one theorem, result, or major idea, together with the material needed to put it in context, will be plenty.

Finally, you need to decide how you want to write your exposition. Here are some ideas, but you can come up with your own:

- Like a textbook: you could use the same format as most textbooks, forgrounding the technical definitions and exact statements of theorems and proofs. (Note that you do need to be doing something different than our existing textbook, so this only makes sense if you have an idea for how you could improve on the textbook, or make a textbook suited for a different audience.)

- Like a short story. (You could also write it like a single chapter of a larger novel, if you feel like that's the right format but don't want to write the whole novel.)

- Like a popularization: there are lots of articles and books attempting to make various mathematical ideas accessible to broader audiences (it's probably a good idea to read, or at least skim, some to make sure you're familiar with the genre)

For part one, write a paragraph (3-4 sentences) explaining what you'll be expositing, how, and to whom, and why you think this combination will work. This will be due on Thursday, March 19th.

Part 2: Writing

Your actual plan would probably take a long time to write (especially if it's something particularly ambitious). The paper will probably be 2-6 pages—the appropriate length depends a lot on the topic and audience. If you find it getting longer than that, talk to me, and we might either cut the topic down or find a way to make it more manageable.
The two things I'll be looking for are:

1. That you understand that math. There shouldn't be any mathematical mistakes in the exposition, and it should include real mathematical content. For instance, it's not enough to just describe a theorem only in vague or intuitive terms, even if you're writing for a less mathematically sophisticated audience.

2. It should be written appropriately for your intended audience and style.

This will be due on Thursday, April 30th.