Math 203 (Proving things: Algebra)
Spring 2018
TR 10:30-11:50 a.m., DRL 3C8
University of Pennsylvania

Welcome to Math 203! This semester we're going to have a great time learning how to construct mathematical proofs, particularly in abstract algebra.

Instructor: Dr. William Simmons, DRL 3N4C, `wsimmo@sas.upenn.edu`.

Office Hours (held in DRL 3N4C): Mondays 1-2 p.m.;   Wednesdays 9-10 a.m.; others, time permitting, by appointment.

Teaching assistant: Andrew Furash, `afurash@sas.upenn.edu`. Office hours: Tuesdays 5:30-6:30 p.m. and Thursdays 12:00-1:00 p.m. (held in DRL 3W8).

Textbook: None! Instead of a traditional textbook, there will be handouts and readings. I will also suggest some references as we go along that may be helpful but aren't mandatory.

Exam and other important dates:

- Add deadline: Monday, Jan. 29

- Midterm: Thursday, Feb. 8, in class

- Drop deadline: Friday, Feb. 16

- Withdrawal deadline: Friday, Mar. 30

- Last day of classes: Wednesday, Apr. 25

- Final exam: Monday, May 7, 12-2 p.m., location TBA; see note below

Course organization: A class like ours (small size and no specific material to get through) provides a great opportunity to learn mathematics by doing it. While there will be some lecture/structured presentation of examples and content, the focus will be on a sequence of proofs and problems through which you will build up the theory from scratch. In class you and your peers will present solutions and ask questions of me and each other. At times we will divide into smaller discussion groups to analyze particular problems. In recitation with Andrew, you will review concepts, see examples related to course work, and work through trouble spots.

Prior to each class meeting, you will receive an assignment with problems to work on and statements to prove. You should do your best to solve them and submit your progress on your private personal page of the class wiki (details below). You will also indicate which problems from the set you would prefer to present to the class. I will pick a number of people to present (I anticipate that you will come up once every 2 or 3 class meetings, but that could vary depending on the problems and how

long our discussions take) while the rest of us ask questions and check that we are satisfied with the proposed solutions. Presenting doesn't necessarily mean that you feel fully confident or even have a correct solution. Rather, you should have engaged the problem and prepared to lead class discussion on it. If you were unable to solve the problem, explain what the difficulty is and what things you tried as well as other possibilities you thought of but haven't fully explored yet. The point is to gain and share insight both in and outside of class. After class, you will revise your solutions and post them to the wiki. The major part of your grade depends on your pre-class work and finalized solutions (see below for further explanation).

Since sharing solutions and asking questions is the heart of the course, attendance both at class meetings and recitation sessions is required (Andrew and I will take roll). The only other basis for evaluation is one midterm exam (to make sure you are learning the basic concepts we are proving things about) and, in some cases, the final exam. The final functions as a sort of make-up if your midterm score is low or your in-class and submitted work need improvement (e.g., you haven't presented enough to earn the grade you're hoping for). If you are content with your grade at the end of the term, then you don't have to take the final.

Course wiki: `http://math203sp18.wikidot.com` I will send you an email invitation to our course wiki. I hope this part of the course will be enjoyable and help you learn together. You will have a private personal page (viewable only by Andrew and me) within the wiki on which to submit your pre-class and finalized solutions as well as store any scratch work you may wish to do. The person presenting a given problem will post a corresponding finalized solution on the public part of the wiki. As you work and study, please make additional pages, crosslink solutions, provide helpful notes, and generally contribute to a useful interactive document that will record the theory we build up throughout the semester.

No LaTeX, HTML, or other coding experience is assumed. We will talk about the basics to help you get started. Whether your work is handwritten or typeset, use complete sentences and correct grammar and show all relevant work needed to understand your thought process.

More details to come in class and on the wiki itself. Above all, let's make it fun and learn something in the process.

Grading: Your grade will be determined by your pre-class solutions (25%), post-class finalized solutions (25%), presentation score (20%; assuming you have a basic level of preparedness to moderate discussion on the problem, this will just count the number of times you present), the midterm (20%), and attendance (10%). The actual scale will depend on how difficult the assignments turn out to be (e.g., if the average on the midterm is 70%, then a 75% means something different than it would if the average were 85%). I will let you know as we go along so that you can track your progress. If you are consistent in doing your pre-class work, write up solid finalized solutions, present about as often as you should given the size of the class, and do reasonably well on the midterm, then you can expect a good grade. Regarding attendance, you have two free absences (whether "excused" or "unexcused") that won't affect your attendance score; if extenuating circumstances absolutely require you to miss more, please talk to me so we can work out a plan.

The one opportunity for extra credit is providing "community service" items on the wiki. For instance, if you find a neat example related to some theorem we prove or have a clean exposition to go along with the formal proof, incorporate it into the wiki and email Andrew and me advising us of it. Reasonable contributions of this nature will give you points to make up for lower-than-desired

scores on attendance or anything else besides the midterm.

We will use Canvas to record grades; please let us know of any errors within a week of the assignment being returned.

Academic Honesty: You must write up your own work so that it represents your own understanding. You are encouraged to study together, talk about problems with others, look at math resources online, etc., but you need to write up homework problems and wiki work on your own (i.e., no copying, whether it be another student's solution or something online). You should also not allow your own work to be copied. If you consult with others or online resources outside of those we provide, please note the source. For your pre-class work, please don't consult outside written sources; rather struggle with it yourself and with classmates. Infractions will result in loss of credit for the assignment and, depending on the situation, university discipline. For more details, see `www.upenn.edu/academicintegrity`.

Accommodations: Please talk to me as soon as possible about accommodations through Student Disabilities Services (Stouffer Commons, 3702 Spruce Street, Suite 300, `http://www.vpul.upenn.edu/lrc/sds/`), scheduling conflicts with religious holidays, athletic events, etc., or working around health issues and other situations.