Presentation Functions
Date: Tuesday Feburary 2
Weight: 10% of Final Grade

1 Preamble

In this presentation you will be required to research topic related to higher level mathematics and provide a brief summary of the field and what it attempts to describe. More details on what to include your presentation ar explained below. You have the choice to work on this presentation alone or up to groups of three (Gender oriented). However, by **Tuesday, December 25** to let me know whether you will work alone or in a group, as well as the topic you have decided to research.

2 Topics

Choose a topic from the following list,

- Algebra.
- Calculus.
- Multi-variable Calculus.
- Differential equations.
- Combinatorics.
- Algorithms (or Optimization).
- Linear Algebra.
- Graph Theory.
- Euclidean Geometry.
- Non-Euclidean Geometry.
- Mathematical Logic.
- Number Theory.
- Real analysis.
- Complex analysis.
- Integer Programming.
- Group Theory.
- Ring Theory.
- Galois Theory.
- Differential Geometry.
- Set theory.
- Commutative Algebra.
- Algebraic Geometry.
- Manifolds.
- Topology.
- Cryptography.
- Computational Mathematics.

3 Outline

This presentation will be composed of two parts. First, you will be required to write up a small paper, containing paragraphs from Parts A, B and C listed below. The other will be the presentation component, this has not strict criteria behind it and is mostly up to you or your group how you wish to present the material.

4 Part A

After selecting your topic, gather preliminary information about it. Specifically, you can answer some of the following questions,

- What is the precise definition of the topic?
- What would one study in this field?
- What are some prerequisites that are required in order to study it.
- What phenomena does it talk about?
- What are some of its applications (if any)?

After gathering enough research to answer some of the aforementioned questions, formalize a paragraph (or two) containing the details of your research.

5 Part B

After introducing the topic, you are know tasked to research the basic axioms, definitions and key theorems that are associated to your topic. These are essentially the building blocks of any mathematical subject. In particular,

- What are the fundamental axioms?
- What are a few fundamental definitions/concepts?
- What theorems and results are of particular significance and why?

After gathering enough research to answer some of the aforementioned questions, formalize a paragraph (or two) containing the details of your research.

6 Part C

After touching upon some of the framework behind your topic, you will now do some research regarding the historical background of your topic. In particular you may want to research,

- When was the field developed or discovered?
- Who were amongst those who have made signifiant contributions to the field?

After gathering enough research to answer some of the aforementioned questions, formalize a paragraph (or two) containing the details of your research.

7 Final Draft

After completing a rough draft of Parts A,B,C, you are now required to formalize a final draft. This final draft **must be typed**, the editor you wish to use is up to you, however since your paper may contain some mathematical syntax and semantics you may wish to use LaTeX, which is a standard editing software used in academia, its the software I use to type your lecture notes, tests, assignment, etc.

NOTE: If your final draft is typed in LaTeX, I will give you an extra 7% on your final presentation grade.

If you wish to type your final draft in LaTeX, then you can ask me how to get started, however you may instead be interested in learning on your own through the internet. This is how I learned to code in LaTeXand other programming languages, and it seems to a more effective learning strategy as opposed to me just lecturing you about it.

8 Presentation

The presentation will be a short 10 - 15 minute discussion where you will touch upon the research you gathered for all of Parts A,B, and C. You are not required to construct or bring any external components the presentation. You will be given the option to use a blackboard should you choose to explain or articulate further on your research during the presentation. The presentation is **not** meant for you to re read your paper verbatim, but is meant to be an informal discussion where you will present to me the findings of your research.

Perhaps an approach to aid you in your delivery is to assume that I am someone of little mathematical background (which happens to be true anyway for most of these topics) where your goal is to explain and dissect your topic in simple terms which enables me to understand it or at least get an intuition for what's going on.