MATH 3H03 (Number Theory) – Fall 2020
Project Information - Creating a poster

Number Theory is a very active area of current research mathematics, but has origins that date back over 2000 years ago (e.g., Euclid). As part of this course, you will work in groups of two to four students, to create a POSTER on a topic in number theory.

There are four possible topics for your poster;

- (Historical) Identify a mathematician that worked in number theory, and create a poster that contains a short biography on this mathematician and their work.
- (Conjecture) Identify an open conjecture in number theory, and create a poster that summarize this conjecture
- (Computational) Create a poster describing how to compute a result in number theory (e.g., identifying pseudo-primes).
- (Expository) Go to the website `https://www.maa.org/node/263/` and look at the section on number theory. Pick a research article, and create a poster that summarizes the content of the article.

Depending upon your topic, you will need to include the following information.

Historical Topic:

1. A biography of the mathematician.
2. The relevant definitions and results needed to state the main results of the mathematician.
3. A clear statement of the main results in number theory proved by this mathematician.
4. A short summary of the impact of these mathematical results.
5. An example of one of the main theorems proved by the mathematician.
6. A bibliography with at least five sources.

Conjecture Topic:

1. The relevant definitions and results needed to state the conjecture.
2. A clear statement of the conjecture.
3. A summary of who made the conjecture and where, i.e., where did the conjecture first appear in the literature.
4. A short summary of what is known about the conjecture (e.g., known cases).
5. An example that satisfies the conjecture (or make a program to test the conjecture).
6. A bibliography with at least five papers related to the conjecture.

Computational Topic:

1. The relevant definitions and results needed to state the object you wish to compute.
2. The algorithm (the code can be pseudo-code, or implemented in a specific language).
3. A summary of who first discovered this algorithm.
4. An example of how your code works.
5. A bibliography with at least five papers related to your computations.

Expository Topic:

1. The relevant definitions and results needed to state the main result of the paper.
2. The statement of the main theorem of the paper.
3. A summary of the proof of the main theorem.
4. An example of the main theorem.
5. A discussion of how this paper expands upon a topic in Math 3H03, and number theory in general.
6. A bibliography with at least five papers related to the main result of the paper.

TOPIC. Your topic most not be covered in class. Find something that interests you. All topics must be first cleared with me. I will give you suggestions on how to find your topic.

PRESENTATION. One (perhaps two days) will be set aside for all student groups to present their poster. Each group will be required to give a 3 minute presentation that summarizes their poster. The date of the poster presentation will be given at a later date. Please note that due to the size of the class, we may schedule all the posters over an entire day or over two days.

POSTER SPECIFICATIONS. Typical science poster are 36" wide. It is recommended that you use LaTeX to create your poster, although you may use PowerPoint. Instructions on how to create a poster (and good design techniques) will be found on the class web page. I will send everyone printing instructors closer to the deadline. **It will cost $20.00 to print your poster.**

GRADING RUBRIC. The grading rubric for the posters can be found on the class web page. This rubric is based upon the rubric that the Canadian Mathematical Society uses to judge undergraduate and graduate posters at mathematical conferences.

REFERENCES. In your write up, I will expect you to include correct mathematical references. Here are some samples. The first is for a journal article, the second is for a book:

1. A. Van Tuyl, The defining ideal of a set of points in multi-projective space. J. London Math. Soc. (2) **72** (2005), 73–90.
2. R. H. Villarreal, *Monomial algebras.* Marcel Dekker, Inc., New York, 2001.

Web pages are a little bit more complicated. For a complete list of possibilities, see:

`http://www.virtualsalt.com/mla.htm`

TIME-LINE. The following schedule will be used:

> January 24, 2020 – Topic picked, with evidence of references, cleared by me. I will also need to who you are working with.
> March 4, 2020 – Poster will be due one week before presentations in order to allow time for printing. **If you miss this deadline, you are responsible for your own printing. Note that most other places charge more than $20.00.**
> March 11, 2020 – Poster Presentation.

Further details on how to submit this information will be given in class.