Math 5362 - Analytic Number Theory
Project Description
Due in Class - Friday November 21, 2014

Write a report describing a well-known unsolved problem related to Number Theory. Your report should include a detailed description of the problem and should address the following, if relevant (please note this list is not exhaustive):

- Why the problem is important.

- Implications if the problem is solved.

- Is the problem connected to any other solved or unsolved problems in number theory or mathematics in general? If so, describe these connections.

- Has the problem been solved in certain cases?

- What methods, tools and approaches have been used, or are currently being used, to try and solve the problem.

Each student should pick a different problem. So once you have decided on the problem you plan to study, please e-mail me to check if it's still available.

Possible problems include:

- The Riemann Hypothesis;

- The Birch and Swinnerton-Dyer Conjecture;

- The Goldbach Conjecture;

- The Twin Prime Conjecture;

- Beal's Conjecture;

- The "There are no odd perfect numbers" conjecture; and

- There are various conjectures on the existence of an infinite number of primes satisfying certain properties e.g. Mersenne primes, Sophie Germain primes, Wieferich primes etc.

On completion of the project, students will also be required to give a short presentation to the class on their chosen project.