**Picking a Research Topic**

Tips for MA470 students

Picking a suitable research problem is arguably the hardest part of completing a quality senior project in mathematics. Only you can pick a suitable topic. As you think about possible topics assess them using the following dimensions:

* A Problem – You want something to solve, prove or do. While you can begin with an area of interest, you will need to refine the topic to a question you want to answer. Can the topic be formulated as a problem you want to solve?
* Your Interests – Pick something that you are interested in, even passionate about. You will be spending a long time thinking about and studying the problem.
* Mathematical Level – This one is tricky. You want a problem that is challenging, but achievable. Trying to prove Fermat’s last theorem as a senior project is futile, yet proving the sum of two even integers is even would be trivial (these are the extremes). The trick is to have a problem that requires some new mathematics (at least to you). I will help assess the expected mathematical level of a project.
* Available Approach – Pick something you have an idea on how to solve. This goes hand-in-hand with the mathematical level.
* Novel Mathematics – Avoid topics that have been done to death. Try and find something that if not totally new, cannot be found in ten minutes of Google searches. Hence, going to Google and searching for “mathematics research topic” will not be helpful.

Finding a topic which scores well on all of these dimensions will be hard. But the hard work now will pay off (big-time!) in January when you will have quality time for research and actually solving the problem.

The traditional way to generate ideas for a problem, and the reason for organization of this course, is to read journal articles. If nothing else, spend an hour or two skimming math articles as much as you can until something catches your interest. Then see what changes you could make to the problem discussed in the article. Perhaps there is a variant that you could study. One huge advantage of going this route is that you also gain a sense of the mathematical level involved and have some ideas for how to solve your problem. It gives you a place to start.