Homework Assignment 5

Assigned Tuesday October 12; not to be submitted.

Required reading.   All of Spivak's Chapter 5.

Recommended for extra practice.   From Spivak Chapter 5: 1, 3, 13, 14, 21, 24, 26, 37.

On Term Exam 1.   It will take place, as scheduled, during the tutorials on Monday October 18th. You will have an hour and 50 minutes to solve around 5 questions, with no choice questions. The material is everything covered in class until Tuesday October 12th (though not including Thursday October 14th), including everything in the relevant chapters (1–5) of Spivak's book (though not including the appendices to these chapters). Some questions will be taken straight from class, some straight from homework, and some will be fresh. Calculators will be allowed but will not be useful beyond emotional support; no devices that can display text will be allowed. Good luck!

Preparing for Term Exam 1.

- Re-read your notes and make sure that you understand *everything*.

- Re-read Spivak's chapters 1–5 and make sure that you understand *everything* (excluding appendices).

- Make sure that you can solve every homework problem assigned or recommended.

- Take a good look at exams, sample exams and exam solutions from previous years. (Scroll down to the bottom of this class' web site and find the relevant links).

- Read the Math 137 page on "How to Solve Problems" (though remember that if there really was a problem solving methodology that *always* works, mathematicians would have been a mere technique rather than an art or a science).

- Come to Derek's office hours Thursday 6-8, or to Shay's Friday 10-12, or to mine Friday 3-5, all at the Math Aid Centre, SS 1071.

- It is much more fun to work in a group!

An often-asked question is "Do we need to know proofs?". The answer is **Absolutely**. Proofs are often the deepest form of understanding, and hence they are largely what this class is about. The ones I show in class are precisely those that I think are the most important ones, thus they are the ones you **definitely** need to know.

Just for fun.   Stare at the expression $\left(\sqrt{2}^{\sqrt{2}}\right)^{\sqrt{2}}$ and prove that there are irrational numbers a and b so that a^b is rational. Can you find *specific* irrational numbers a and b so that a^b is rational?

Notice that these are two questions and not one. There is some interesting tale on the philosophy of mathematics for which this is a prime example; have your professor tell you about it some day between XX:00AM and XX:10AM.