

UNDERGRADUATE MATHEMATICS SEMINAR

The information for the next meeting of the seminar is as follows:

DATE: MONDAY, November 3rd

Time & 4:15pm – Refreshments in the Math Common Room, **Bailey 204**

Location: 4:30pm – Seminar in **Bailey 207**



In this seminar, Union College's own **Professor Susan Niefield** will deliver the following talk:

TITLE: Which is Larger, e^π or π^e ?

ABSTRACT: Two years ago, while studying π , one of my thesis students found an interesting paper addressing this question.

Given positive real numbers $x < y$, which of the following holds: $x^y < y^x$, $x^y > y^x$, or $x^y = y^x$? It is easy to see that all three cases are possible. For example, $2 < 3$ and $2^3 < 3^2$, since $2^3 = 8$ and $3^2 = 9$, but $3 < 4$ and $3^4 > 4^3$, since $3^4 = 81$ and $4^3 = 64$. One can even get equality, e.g., $2^4 = 4^2$, since both are 16.

Of course, $e < \pi$ and both are close to 3. Does π act like 3 in the first inequality so that $e^\pi < \pi^e$? Does e act like 3 in the second inequality so that $e^\pi > \pi^e$? Or, do they both act like 3, so that $e^\pi = \pi^e$?

In this talk, we will use a little calculus to determine the relationship between x^y and y^x , for every pair of positive real numbers. As a consequence, we will see that $x^y = y^x$ holds for infinitely many pairs, but $2^4 = 4^2$ is the only case where both are integers.

Where Are They Now? Lauren Canepari '06

Since I graduated from Union in 2006 life has been pretty crazy. Throughout my time at Union, and specifically in the math department, I was focused on making Math my career. Before I came to Union I had no idea I was even interested in math, and it was one professor my freshman year that made me realize that I wanted to be a math major.

I always enjoyed all of my classes, and even had the opportunity for independent study with some great professors. I also attended the Summer Program for Women in Mathematics during the summer after junior year. This program allowed me to interact with students from all over the country and see some career opportunities for math majors. I would definitely recommend such a program to anyone. With all

of these cumulative experiences, I applied for PhD programs during senior year. Unfortunately, my lack of taking differential equations or probability greatly hurt my GRE subject test score, and my choice of PhD programs became very limited. In the end, I left Schenectady for New York City to enter the CUNY PhD program in pure mathematics. At this point I had become unsure if a PhD in math was really what I wanted, but I felt it was the only thing that I had been prepared to do after graduation.

After one semester at CUNY I decided that pure math (and just a PhD in general) was definitely not for me! This was a hard realization to come to, but I realized I just wasn't cut out for a life in academia. Now directionless, I decided to

intern at a few different places to explore my options. I worked in an investment bank, for a real estate developer, and bartended all at the same time! In the end I realized that it was important to me that I complete my masters, and to somehow not let all of that pure math go to waste.

I applied to various programs, mostly in financial or applied math. I hoped that a masters program in one of these disciplines would allow me to use my mathematical skills while becoming more prepared to enter the work force. In the end, I accepted an offer for a one-year masters program in applied math at the London School of Economics. So I spent the past year in London, studying everything from finance to computer programming. Although it was a huge challenge (especially the programming part), it let me finally apply some of that pure math and make me more marketable at the same time. It was also a huge transition from the American to European educational system, as we had all of our exams at once, and the grade for that exam is the grade you receive for the course.

Having survived that, I moved back from London this September, trying to job hunt at probably the worst time ever! In the end I found a great job at a real estate investment company in Boston, which I just started two weeks ago. Although the past two years have been a rollercoaster, I wouldn't have had it any other way.

Resources for Students

- **Searching for a Summer or Full-time Job?** IBM is holding an information session on Wednesday, November 5th at 1pm in Science and Engineering N102. If you are interested, they are asking you to join alumni and hiring managers for pizza and soda to learn about internships and full-time employment opportunities.
- **Calling all Photographers!** The Mathematical Association of America (MAA) is looking for math-related images for their "Found Math" feature. Send them, along with a brief description, to editor@maa.org



FOUND MATH: This arched sculpture on the grounds of the University of Calgary resembles a parabola (or perhaps a catenary). Photo by Dave Wagner, University of New Brunswick.

Problem of the Newsletter: October 31, 2008

Congratulations to Schuyler Smith for correctly solving last week's problem. A copy of his winning submission has been posted on the bulletin boards around the Math Department in Bailey Hall.

Here is this week's problem (from *The Problem Solving Competition*): How many of the positive factors of the number 36,000,000 are *not* perfect squares?

Professor Friedman will accept solutions to this problem until 12:00 noon Thursday, November 6th. Email your solution to him (friedmap@union.edu) or put it in his mailbox in the Math Department's office on the second floor of Bailey Hall.