



## Cornell University

K-12 Education and Outreach, Mathematics Department

### MATH 5080 – Mathematics for Secondary School Teachers

March 11, 2017 ◆ 9:00 AM – 2:30 PM (lunch provided) ◆ 406 Malott Hall

**8:45 – 9:00 AM** Bagels & Juice (provided)

**9:00 – 9:15 AM** Introductions

**9:20 – 10:00 AM** Why Do They Come – Why Do They Stay? Career Motivations Among Technical Undergraduate Students

**Speaker:** *Amy Beth Prager (Independent Consultant)*

In this presentation I will discuss an empirical study examining the reasons why undergraduate female students select and remain computer science majors at Carnegie Mellon University. At the end we will explore together ways to increase the diversity and inclusivity of people entering the technology sector.

**10:10 – 11:45 AM** On the Possible Values of  $\pi$

**Speaker:** *Kelly Delp (Cornell University)*

What happens to the geometry of the plane if we change the way we measure distance? We'll introduce the notion of a metric (a way of measuring distance) and explore the properties of one specific metric on the plane called the *Manhattan metric*. We'll see what circles look like in this metric, calculate circumferences, and determine the value of  $\pi$ . As time allows, we'll introduce an infinite family of metrics on the plane, which includes both the Euclidean and Manhattan metric, and state some results comparing the values of  $\pi$  in this family of metrics.

**11:45 AM – 12:15 PM** Lunch (provided)

**12:15 – 1:15 PM** Math Learning Through Games

**Speaker:** *Lee Kaltman (Independent Consultant)*

At the earliest of ages to the later stages in life we learn/feel enjoyment by playing individual and group games. What mathematical content do we learn/master from playing different games? How can we use games to increase math literacy (common core aligned) for both young and old? This presentation will include a short talk, and then offer group activities for colleagues to work on together and then share out. Bring your *game caps*!

**1:25 – 2:25 PM** The Mathematics of Pumping a Swing

**Speaker:** *Richard Rand (Cornell University)*

We are all familiar with how we can increase the motion of a swing by moving our legs or body, a process called pumping a swing. In this lecture we try to understand the physics of pumping a swing by treating the swing as a pendulum, and applying the methods of nonlinear dynamics.

**2:25 – 2:30 PM** Wrap-Up

**RSVP by Monday, March 6, 2017**

**Registration Form:** <https://www.math.cornell.edu/m/Community/5080#form>

**Questions? Contact Mary Ann Huntley** ([huntley@math.cornell.edu](mailto:huntley@math.cornell.edu))