Cornell University

K-12 Education and Outreach, Mathematics Department

MATH 5080 – Mathematics for Secondary School Teachers

September 23, 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 – 10:20 am **Cutting, Pasting, & the Difficulties of Counting**
Inna Zakharevich, Ph.D. (Cornell University, Mathematics)

Suppose that you want to carpet your living room, which you know is 200 ft^2. You go to the store and buy 200 ft^2 of carpet. Will you always be able to carpet your living room with it? In the talk we'll answer this question in our usual geometry as well as others. We will then consider the analogous question of filling a box with foam.

10:30 – 11:30 am **The Decimal System & Other Ways to Represent Numbers**
Julia Gordon, Ph.D. (Cornell University, Mathematics)

What does the decimal representation of a number mean? We will explore this question and some consequences (e.g., quick ways to determine whether a number is divisible by 7 or 11), and then discuss other ways to represent numbers (e.g., using different bases). This ultimately leads to the notion of p-adic numbers, which play a large role in modern number theory.

11:40 – 12:10 pm **Lunch (provided)**

12:20 – 1:20 pm **The Mathematics of Queueing Theory**
Jamol Pender, Ph.D. (Cornell University, ORIE)

I will present an introduction to the theory of waiting in line and how it is applied various settings (e.g., approaching a bridge on a highway, waiting in line at an amusement park, investigating hospital wait times during an ER visit).

1:30 – 2:30 pm **Beware of the Bombardier Beetle!**
Richard Rand, Ph.D. (Cornell University, Mathematics)

I will discuss a mathematical model of the bombardier beetle. This insect has a unique defense mechanism: ejected fluid (hot acid) comes out of its butt onto its enemies in a pulsed machine-gun fashion, rather than in a continuous stream like a garden hose.

RSVP by Thursday, September 14, 2017

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

Questions? **Mary Ann Huntley** (huntley@math.cornell.edu)