



Cornell University

K-12 Education and Outreach, Mathematics Department

MATH 5080

Mathematics for Secondary School Teachers

November 1, 2014

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**

9:15 – 11:45 am **Using Algebraic Expressions to Reveal the Math Behind Puzzles**
Speakers: John Maceli & Cristina Gomez (Ithaca College)

During this session, we will explore some puzzles as context for investigating the use of expressions and equations. These puzzles can be used to promote the development of a productive disposition towards mathematics with a wide range of students.

11:45 – 12:15 pm **Lunch (provided)**

12:15 – 2:15 pm **What Comes After the 3-4-5 Right Triangle?**
Speaker: Steven Strogatz (Cornell University)

The 3-4-5 right triangle is a perennial favorite when we ask our students to work with the Pythagorean theorem. We like it because it involves whole numbers (3 squared plus 4 squared equals 5 squared) and thus avoids having to deal with irrational numbers coming from square roots. When that example gets old, we wheel out the 5-12-13 triangle, or maybe (getting really exotic here) the 7-24-25 triangle. All of these are "Pythagorean triples," meaning that they satisfy $a^2 + b^2 = c^2$ where a , b , and c are whole numbers. Do you see the pattern here? Can you use it to guess the next Pythagorean triple? Do Pythagorean triples go on forever? In this interactive session, I'll show how such questions can make for a fun activity in pattern recognition and discovery. Then using Cartesian equations for a certain (cleverly chosen!) line and circle, we can find all possible Pythagorean triples. These various activities tie together many ideas often discussed separately in middle school and high school (lines, circles, slope, simultaneous equations, quadratic equations, Pythagorean theorem, proof by induction, etc...)

2:15 – 2:30 pm **Closing**

RSVP by Thursday, October 23, 2014

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

Questions? Contact Mary Ann Huntley

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