



Cornell University
K-12 Education and Outreach, Mathematics Department

MATH 5080

Mathematics for Secondary School Teachers
November 19, 2011
9:00 am – 2:30 pm
406 Malott Hall

8:45-9:00 **Welcome** (juice and bagels provided)

9:00-9:15 **Introductions**

9:15-11:00 **Digital Natives & the NTCM Communication Standards**
Chris Hartmann (PTC)

From their phones to their laptops, today's students (aka "Digital Natives") demonstrate facility using keyboards to communicate their ideas, their feelings, and their homework. Mathcad Prime, a whiteboard environment designed for scientific and mathematical communication, enables users to combine text, numeric and symbolic calculations, data tables, graphs, and symbolic tools in a single document. This hands-on workshop will focus on ideas for using Mathcad Prime to improve students' mathematical and scientific communication skills, as recommended in NCTM's *Principles and Standards for School Mathematics* (2000). What could your students do with a word processor that had a graphing calculator built into it? You will find out in this workshop!

11:00-12:15 **Allowing Children to Understand Math**
Irvin M. Miller & Robert L. Morrison (Math & Physics Exploration)

This session will focus on demonstrating how elementary mathematics lessons are intertwined with middle- and high-school topics. We will show how to introduce proofs and teach effective study and learning techniques. A mechanical implementation of the 3x3 magic square will be used as a model.

12:15-12:45 **Lunch** (provided)

12:45-2:15 **Reaching Recalcitrant High School Students**
Irvin M. Miller & Robert L. Morrison (Math & Physics Exploration)

In this session we will discuss how rate problems provide a foundation for geometry and fractions, and how the binomial expansion and the distributive rule ties mathematics together. We will take the binomial expansion into trigonometry, geometry, algebra, and calculus, thus showing the importance of complex numbers. We will augment this with a discussion of how the magic square develops productive habits for studying, learning, and thinking.

2:15-2:30 **Wrap Up**

RSVP to Mary Ann Huntley by 5 PM on Wed., Nov. 16th if you plan to attend.
E-mail: huntley@math.cornell.edu Phone: (607) 255-5529