New Colleagues Paper Session

Saturday, November 17, 2007

Session I – Hemenway Hall 225

8:00 AM – 8:15 AM

The Negative Pell's Equation's Evolution
Peter Nordberg, Worcester State College

While there are well known integer solution generators to both of the following formula: $x^2 - py^2 = +1$ and $x^2 - py^2 = -1$ where p is square-free, and while the former equation posses a well know recursive formula, a recursive formula for the second is harder to find. The purpose of my discussion is to introduce two new recursive formulas for the second involving only multiplication and addition and a formula expressing a useful relationship between successive solutions to the second equation.

8:20 AM – 8:35 AM

Vector Dependence
Shannon R. Lockard, Bridgewater State College

This talk will discuss linear dependence among binary vectors that are randomly generated according to a given probability model

8:40 AM – 8:55 AM

Rational curves on Calabi-Yau 3-folds
Bin Wang, Rhode Island College

There is the simplest 1-dimesional algebraic variety, which is called ``rational curve". There is nothing to study about a rational curve itself. But the questions about rational curves in another variety X have fundamental importance in understanding of the variety X. Basically there are three types of questions: (1) Are there any rational curves on X? (2) If there are, are there finitely many? (3) If there are infinitely many rational curves, can they be anywhere on X? Each type of questions aims at the variety X of certain fundamental type. For example, the question (2), the finiteness of the number of rational curves, aims at study of smooth Calabi-Yau manifold (or variety). In this talk, we will introduce some of the exciting developments and outstanding conjectures behind the question (2).

Session II – Hemenway Hall 227

8:00 AM – 8:15 AM

Using algebraic geometry with error-correcting codes
Caleb Shor, Bates College

Error-correcting codes are ubiquitous in everyday life, from check digits in credit card numbers to compact disc players to digital communication. In this talk, we will explore the properties of such codes and see how one creates them using curves over finite fields.

8:20 AM – 8:35 AM

Cardano's Contributions to Cryptography
Marina Vulis, University of New Hampshire

The great mathematician Girolamo Cardano was also known for his contributions to cryptography. He invented the Cardano Grille for writing secret messages and the autokey cipher.

8:40 AM – 8:55 AM

A Visually Intuitive Derivation of Faulhaber's Formula
Patrick Lorenz, Maine Maritime Academy

Visualizing the expression $\sum_{k=1}^{n} k^p$ over various p is pedagogically useful. This intuitive approach leads to a conjectured general formula that is subsequently proven

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Session III – Hemenway Hall 229

8:00 AM – 8:15 AM

Don't Give Us Any Responsibility!
Christine von Renesse, Westfield State College

"Don't give us any responsibility!" This was an answer on my mid-term evaluation this fall. Knowing that as a new faculty member I am lacking experience, I will still present my attempt to address this problem: that students don't take enough responsibility for their learning and their thinking. After a short presentation there will be space to share our experiences and strategies.

8:20 AM – 8:35 AM

A Function Field Trip
Rebecca Metcalf, Bridgewater State College

This presentation will discuss understanding the definition of function through active learning and the "function field trip." Written assessment for this activity will be discussed.

8:40 AM – 8:55 AM

Collaborative Assessment & Youth Achievement in Mathematics
Karen Terrell UMass-Boston

I will discuss an instructional method that I am implementing in my courses, collaborative assessment, and introduce my future research on youth achievement in mathematics.