MATHEMATICS DEPARTMENT ORAL PRESENTATIONS

Presenter	Title	Description	MCLT	Start - End	Day
Emily Everson	Mathematics in Economic Modeling: An Exploration of Young's Theorem	This paper explores some applications of calculus within economic modeling. Specifically we investigate Young's Theorem, or the Symmetry of Second Derivatives, and make connections between what functions behave in accordance with Young's Theorem and what these types of functions mean in the context of an economic model.	131	12:30 -1:00 PM	F
Mathilde Moller	Latin Squares and their relevance to Sudoku Puzzles	This presentation explores some of the properties of Latin Squares in order to extend results about Latin Squares to solutions of the number puzzle Sudoku.	132	12:30 -1:00 PM	F
Sydney Currier	Using Logistic Regression to Predict the Probability of Breast Cancer	We explain the main concepts behind logistic regression, including the odds ratio, and discuss ways we can use it to predict possible breast cancer cases.	131	1:00 -1:30 PM	F
Rebecca Goulson	Exploring Differential Equation Models of the HIV Infection	This project sets out to display the importance of differential equations through the interactions of susceptible, infected, and immune cells. Various models are examined including one with a cure rate.	132	1:00 -1:30 PM	F
Michael Briden	Directed Graph, Nearest Neighbors, and Horses	We define an algorithm for approximating the shortest distance on a directed weighted graph. Then we apply the algorithm to a real life situation. We will approximate the shortest path needed to take 27 horses from there stalls to their respective fields.	131	1:30 -2:00 PM	F
Noah Kime	q-analogues and the Equidistribution of t-subset Sums Modulo m	We give a brief introduction to q-analogues. We then use these definitions to prove a condition for the equidistribution of the subset sums of N = {1,2,...,n} with t elements modulo m.	132	1:30 -2:00 PM	F

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Owen Hunt	Investigating Elusive Perfect Numbers	Through investigation of the definitions and properties associated with prime and perfect numbers and how they relate to number theory and modern mathematics, the feasibility for the existence of infinitely many perfect numbers, and the possibility of odd perfect numbers, will be discussed.	131	2:00 -2:30 PM	F
Daisy Johnson	The Lucas Numbers	In this presentation we investigate the properties and identities of the Lucas numbers. Also we explore a close relationship between the Fibonacci and Lucas sequences. In addition, we look at an application of the Lucas numbers.	132	2:00 -2:30 PM	F
		POSTER PRESENTATION SESSION: Morken Center 1st Floor **SNACK BUFFET**: Atrium	**Floor 1**	**2:30 -3:30 PM**	**F**
Alan Perry	BCH Codes	A discussion on the algebra that shows we can linearly relate the information needed to correct errors in corrupted messages, and the implications for the algorithms which use this algebra.	131	3:30 -4:00 PM	F
Dani Andrews	Relationships Between High School Algebra, Abstract Algebra and Teaching	This presentation is comparing high school algebra with abstract algebra and then relating both to teaching.	132	3:30 -4:00 PM	F
Rebecca Byrne	Fourier Analysis	We explore Fourier Series as a way to model periodic phenomenon and investigate the convergence of the sequence in the process. The Fourier Series has broad applications in models that are periodic in time as well as periodic in space.	131	4:00 -4:30 PM	F
Kyle Geinzer	Group Actions on Sets and How It Relates To Combinatorics	This paper will discuss how groups relate to combinatorical questions. We will cover a brief background in both Abstract Algebra and Combinatorics followed by an explanation the link that brings them together in order to solve difficult level combinatorical questions.	132	4:00 -4:30 PM	F

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Andrew Koval	Linear, Multivariable and Logit Regressions	This papers looks into the basic properties of linear, multiple variable, and logistic regression models. Several of the assumptions made about these models (such as the modeled variance of the response variables and the claim of the least biased estimators) are proven, and a look into the more complex models is given.	131	10:00 -10:30 AM	S
Kevin McCrossin	Ranking Evenly Matched Teams in a Round Robin Tournament	This presentation provides a brief introduction to ranking teams with equal wins and losses in a round robin tournament. First, we will investigate properties of tournament matrices. Next, we shall look at the Perron-Frobenius Theorem and how it will help in ranking teams. Finally, we will end with discussing two simple ways to rank evenly matched teams in a round robin tournament and end with an example.	132	10:00 -10:30 AM	S
Perri Pettit	Myth or Math	A Statistical Analysis of the Gender Wage Gap	131	10:30 -11:00 AM	S
James Van Alstine	Generalizing valuation maps to rational base representations.	We briefly define rational base representations and introduce a family of trees that describe the important features of this method of representing numbers. Then we discuss a valuation-like map that is a generalization of the p-adic valuation.	132	10:30 -11:00 AM	S
Rachel Kinkella	Linear/Integer Programming	This presentation considers the fundamental theorems of both Linear and Integer Programming, the proof of the Fundamental Theorem of Linear Programming, and methods for solving both Linear and Integer Programming problems.	131	11:00 -11:30 AM	S
Samuel Kiefer	The Riemann Zeta Function	We give a brief look at Riemann's Hypothesis and explore the Riemann zeta function.	132	11:00 -11:30 AM	S

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Erik Wolf	Probability Theory and Winning a Game of "Dominion"	The card game "Dominion" can be generalized to include two optimal strategies. By using cumulative probabilities and hypergeometric distributions, the probability of having enough treasure to buy the best victory point cards is explored. Bayes theorem is also used to analyze the function of Action cards in an "Engine" strategy.	131	11:30 AM -12:00 PM	S
Madison Silva	Searching for Prime Numbers	We explore algorithms used to generate prime numbers, specifically the Sieve of Eratosthenes and the Sieve of Sundaram, including looking at algorithm complexity and primality tests.	132	11:30 AM -12:00 PM	S
In Morken Center 103		**COMPLIMENTARY PIZZA**	**103**	**12:00 - 12:30 PM**	