

The Sum Times

February/March 2014

Special points of interest:

Message From the Chairperson

Senior Exit Interviews!

Spring Semester Dates to Remember

Fall 2014 Math Elective Classes

STUDENT SPOTLIGHT

Pi Day Bake Sale

Math Club T-Shirts

Career Night

Math Learning and Resource Center

Message from Dr. Norton

Quiz

- If we have 10 inches of snow tonight, then we will cancel class tomorrow. Write the converse of this statement. Give a counterexample for why the converse is not true. You may want to use the word "ice" or "electricity."
- Give an example of the idea of inverse proportionality. You may want to use the word "patience" and the phrase "amount of cumulative snowfall."
- Probability: show that $P(\text{I will finish my syllabus}) = \epsilon \rightarrow 0$ as $t \rightarrow \text{May}$.
- Discuss meteorology in the context of chaotic dynamical systems. Illustrate how periodic behavior can occur in a chaotic system.
- Two objects/states are defined as $x = \text{"driveway covered with snow"}$ and $y = \text{"driveway clear of snow"}$ and an operation is defined by "shovel all of the snow away." Is this operation unary or binary? Discuss this as a function on the set $\{x, y\}$. Do the concepts of identity and/or inverse make sense in this context?



Dr. Douglas Norton
Dept. of Mathematics and Statistics Chairperson

Okay, enough already! What a strange start to a semester! I hope that you have found and will continue to find ways to either combine in interesting ways or sign treaties of mutual coexistence between the mathematics and the real-world distractions of the semester. Remember: before too long, we'll be complaining about how hot it is, remembering fondly a warm fireplace, a cup of hot chocolate, and a good basketball game on the television! Have a great remainder of the semester.

ATTENTION SENIORS: Dr. Norton will conduct a 15-minute exit interview with each graduating senior. Date/time details will be sent via email. Please contact Marie O'Brien if you have any questions!

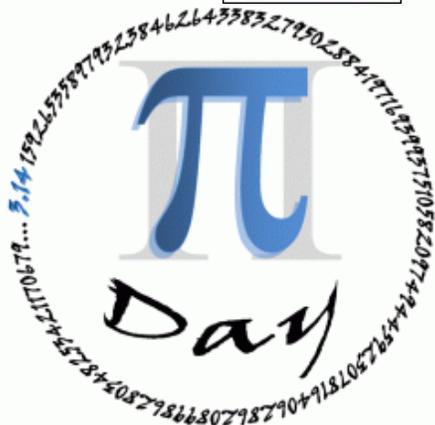
Become a fan of the Department of Mathematics and Statistics at Villanova University page on



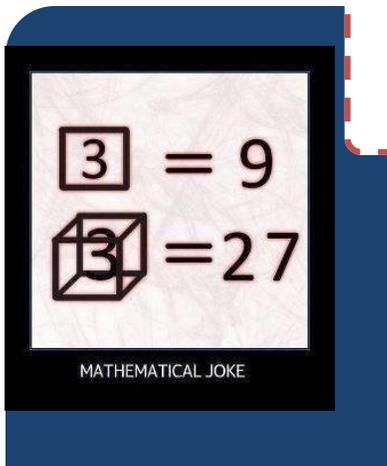
HAPPY SPRING Students and Faculty!

Spring Semester Dates To Remember:

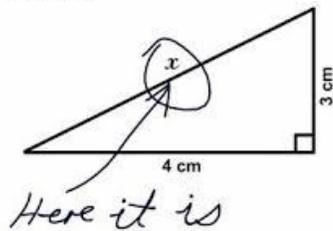
Mar. 3 (M)	Semester Recess
Mar. 10 (M)	Classes Resume
Mar. 12 (W)	Grades Due (Noon)
Mar. 14 (F)	Registration Advising Begins
Apr. 2 (T)	Last Day for Authorized Withdrawal (WX)
Apr. 16 (W)	Easter Recess begins after last class
Apr. 22 (Tu)	Classes Resume
May 1 (Th)	Final Day of Classes
May 3-9 (Sat-F)	Final Examinations
May 12 (M)	Final Grades Due (Noon)
May 16-17 (Fri-Sat)	Baccalaureate and Commencement



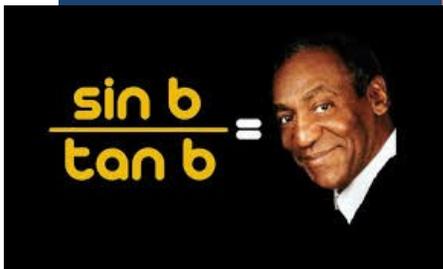
Fall 2014 MAT Electives



3. Find x .



Ocular Trauma - by Wade Clarke ©2005



**3 OUT OF 2
PEOPLE
HAVE
TROUBLE
WITH
FRACTIONS**

MAT 4310 Statistical Methods E. Pasles & J. Pigeon

This course is an introduction to data summarization and various statistical methods that will allow students to begin to build up a toolbox of statistical techniques for handling data analysis. The class will study probability distributions that will serve as the foundations for these methods. The statistical methods that the class will study include point estimates, interval estimates and hypothesis tests for population means, variances and proportions, categorical data analysis, regression and correlation. Prerequisite: MAT1505.

MAT 4600 Deterministic Operations Research B. Pollack-Johnson

The course covers various topics, including deterministic methods, mathematical optimization, linear programming, formulation and solution techniques, duality, integer linear programming, transportation problems, assignment problem, network flows, and dynamic programming. Prerequisite: MAT 2705

MAT 5110 GeometryA. Deanin

This course offers a unique perspective on the well-known mathematical discipline. Topics covered include affine, hyperbolic, spherical, elliptic, Euclidean and projective geometry. Prerequisite: MAT 2600

MAT 5700 Math Statistics I J. Frey

Topics covered in MAT 5700 include probability, random variables, joint distributions, expected values, covariance, correlation, the moment generating function, Chebyshev's inequality, and important families of random variables. Students who are interested either in statistics or in actuarial science should strongly consider taking this course. There is a substantial overlap between the course syllabus and the syllabus for the first actuarial exam. **This course in Fall 2014 will count as a second analysis course.** Prerequisites: MAT2500 and MAT2705

MAT 5920 Topic: Coding Theory A. Woldar

It's not hard to imagine a world without coding theory. Simply imagine a world bereft of all forms of digital technology, that is to say, no computers, no DVD or CD players, no mobile, cellular or gaming devices, etc. The problem arises due to physical limitations on circuitry and channel reliability. Decades ago, when processors were capable of carrying out only a few hundred instructions per second, a computer (in the absence of coding theory) could run for perhaps several minutes before shutting down. The reason machines can turn on today while carrying out over 500,000,000,000,000 instructions per second is due to coding theory. In this course we study the mathematics underlying the design and development of codes, starting with the more naive early ones and moving progressively to the more sophisticated ones (for example, those used in the NASA Space Program).

MAT 5920 Topic: Intro to Bayesian Statistical Data Analysis

O. Marrero The course prerequisite is MAT 1505. The course is intended as a companion and a complement to MAT 4310. We'll use the software R.

Don't forget to make an appointment with your advisor prior to your registration date/time. All advisors have their office hours posted at their office.

[MAT 5920 Topic: Design of Experiments](#) P Lupinacci

Students should contact Dr. Lupinacci for information.

[MAT 5930 Topic: Fourier Analysis](#) A. Gluchoff

Fourier Analysis is a mathematical tool to investigate physical phenomena which can be represented by trigonometric series: orbits of planets, vibrating strings and plates, transfer of heat, signal processing are examples of these applications. In this course we study the fundamental questions involved in expressing a function by sines and cosines: which functions are so representable, what can be done with the series. In doing so we revisit some of the topics of standard advanced calculus such as continuity, differentiability, integrability, infinite series, and convergence, but with the above mentioned questions in mind. Unexpected side topics include some material on fractals, jagged curves, and smoothing of signals. This course will satisfy the analysis requirement for math majors.

[MAT 5900 Seminar: Number Theory](#) R. Styer

"Primes, divisors, Euclidean algorithm, congruences, Chinese Remainder, quadratic residues, ideas of Fermat and Euler, We begin with an overview of number theory for a few weeks, then we peruse unsolved problems in number theory and choose a problem to work on. Past math majors have chosen topics such as perfect numbers, happy numbers, Put or Take a Square Game, the IRS game, Gaussian primes, magic squares, multiplicative persistence, Egyptian fractions, the Kimberling shuffle, the Riemann hypothesis, You will give a series of short talks and write short paper drafts, until by the end of the semester you are ready to give an inspiring talk and turn in your practically perfect paper. A number theory problem is waiting for you to adopt it!

Student Spotlight



Ever wonder what some of your fellow classmates are doing professionally?

Villanovans in general have a history of finding successful career and post-grad opportunities with their degree, and this is certainly true for our math majors too! Here are a few examples of the excellent opportunities that your fellow math majors have earned:

Denis Whelan	'14	Fulbright Finalist for English Teaching Assistantship in Spain.
Rachael Cohen	'14	Full-time Business Technology Analyst at Deloitte Consulting in Arlington, TX.
Courtney Bahlman	'15	Summer Analyst at Barclays Capital in NYC.
Luke Allen	'15	Summer Analyst at Goldman Sachs in NYC.

Let us know of your plans for the summer or after graduation and we'll feature you in the next Sum Times!

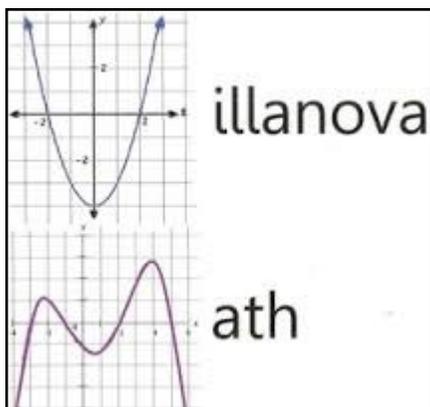


Search "Villanova Mathematics and Statistics Alumni" on LinkedIn and request to join to network with current and past Villanova Math Alumni!

WE ARE ORDERING
SHIRTS!!

Please email
tsittig01@villanova.edu
by March 12th if you are
interested in purchasing a
shirt for \$10.

T-Shirt Front



T-Shirt Back



CONGRATS

NEW EXEC!

President: Danielle Riverso

VP: Karolina Golabek

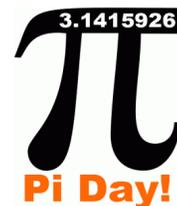
Treasurer: Caroline Staub

Wish them luck moving forward!

Math Club News!

HAPPY PI DAY!

BAKE SALE



FRIDAY—MARCH 14
11:00 A.M. TO 4:00 P.M.

Celebrate Pi Day with the Math Club! This year we will be celebrating with a bake sale that will take place between 11 and 4 near Café Nova. All of the money received will be donated to The Starfish Foundation which was started by Villanova alum and math major Beth Awalt. This non-profit organization provides scholarships and guidance to high school students in extreme poverty who wish to continue their education. Your donations can help encourage and inspire these students to reach their dreams!

MATH CAREER NIGHT!

We are going to have a career night in late March where Villanova Math alumni are going to come to campus and discuss their current jobs. If anyone has any input into the types of field they would like to hear from please Tom Caruso at tcarus02@villanova.edu and he will try to find an alumni from that profession. This is a great chance to meet fellow Novans and see how you can leverage your Math Major into a successful career!

Mathematics Learning and Resource Center

THE MLRC IS LOCATED IN ROOM 211 OF THE FALVEY LIBRARY. IT IS OPEN **MONDAY THROUGH THURSDAY 1:00PM-5:00PM & 6:30PM-9:00PM.**

RESOURCES AVAILABLE INCLUDE A WALK-IN TUTORIAL SERVICE, PRIVATE TUTORIAL SERVICE, A COMPUTER LAB, AND A VIDEOTAPE TUTORIAL LIBRARY. YOU MAY ALWAYS CALL IN ORDER TO SCHEDULE AN APPOINTMENT AT

610-519-MLRC (6572) OR CHECK OUT WWW.VILLANOVA.EDU/MLRC FOR MORE

INFORMATION!

DON'T WAIT UNTIL

IT'S TOO LATE!

(THE DAY BEFORE

AN EXAM IS!)

