

Math



Mess

Department of Mathematics
St. Olaf College
Northfield, MN 55057

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This Week's Mathematics Colloquium

Title: Biostatistics at Mayo Clinic or: What do all of these mathematics types do?

Speaker: Terry Therneau

Time: Tuesday, October 8th, 1:30 pm

Place: SC 182

This Week's Colloquium

Terry Therneau graduated from St. Olaf in 1975 (an awfully good year!) and went on to get his PhD in statistics from Stanford. He is currently working as a lead statistician for the Mayo Clinic. Here is how he sums up his work: "As a statistician engaged in clinical research programs, my interests reflect both medical and statistical areas. The former has been focused for the last several years on liver disease, liver transplant, hematology with particular emphasis on plasma cell malignancy, and physical medicine. Statistically, the major impetus of my work has been in survival analysis."

The division of Biostatistics at Mayo is one of the largest groups of its kind in the country:

In any given year there are over 1200 different research studies and its data archive contains over 9000 unique data sets. Dr. Therneau will present an overview of two different projects

from the clinic that that he has worked on. A smaller one, comparing two treatments to aid wound healing in the presence of circulation problems, and a larger study on the relationship between mammographic breast density measurements, familial genetic factors, and breast cancer risk. Focus will be on the actual medical question at hand, how the study design and statistical issues interact in pursuing the analysis, how people work together on a research team, and the final results of the study.

Last Chance for the Putnam!

October 11th is the deadline for Putnam registration! If you are interested in the test, you must contact *Professor Molnar* (molnar@stolaf.edu) on or before this Friday. Anyone not registered by Friday cannot take the exam. (See the back page for more details.)

The Putnam Exam (sponsored by the MAA) is on December 7th this year. This competition is open to

all undergraduates in the U.S. and Canada. The contest runs from 9 to 12 and from 2 to 5, with six problems in each session. Pizza and scintillating conversation will be provided by the Math Department during intermission.

Carlson Winners

Congratulations to everyone so bold as to take a problem solving exam written by Dave Molnar and Cliff Corzatt. The high scorers receive pizza and cash, while the low scorers will be forced to listen to Professor Molnar's music.

First-Year Winners

Honorable mention: Dan Visscher

Honorable mention: Elissa Ordemann, Heather Evjen, Kristin Herreid

3rd Place (\$15/per) : Philip Schulte, Tim Dauwater, Brian Kuhagen

2nd Place (\$25/per): Emily Moen, Maggie Johnston, Justin Fredenburg

1st Place (\$35/per): Kyle Manley, Adam Hubbell, Jonathan Olson.

Non-First-Year Winners

Honorable mention: Michael Zahniser.

Honorable mention: Jason Grimm, Erik Johnson, Mark Schmelzle

3rd (\$15): Adam McDougall, Nick Maryns, Jason Saccomano

2nd (\$25): Matt Handley, Janette Herbers, Scott Harris

1st (\$35): Jerad Parish, Jonathan Von Stroh.

Tutoring Opportunity

The Academic Support Center is looking for a few good tutors! If you have experienced the thrill of figuring out a math problem and would like to help others to have that feeling too, why not apply to be a tutor for the ASC?! You actually get paid to do it and what you earn counts toward your student work award (if you have one), but you do not need to have a student work award to be a subject area tutor. If you are interested, call the ASC at x3288 and set up an appointment to talk with Linne Jensen about applying to be a math tutor.

Last Week's Problem

Prove that power-speed number, $2(HR)(SB)/(HR+SB)$, is always less than or equal to the arithmetic mean, $(HR+SB)/2$.

This problem was solved by Brian Peters '05, Robert Orme '05, and Paul Zorn.

Any proof rests on the inequality $(HR - SB)^2 \geq 0$.

From this, it follows

$$HR^2 - 2(HR)(SB) + SB^2 \geq 0;$$

$$HR^2 + 2(HR)(SB) + SB^2 \geq 4(HR)(SB);$$

$$(HR + SB)^2 \geq 4(HR)(SB);$$

$$\frac{(HR + SB)}{2} \geq \frac{2(HR)(SB)}{(HR + SB)}, \text{ with equality only}$$

when $HR=SB$. Of course, the "power-speed number" is just the *harmonic mean* of HR and SB ; see <http://mathworld.wolfram.com/topics/Means.html>.

Problem of the Week

You are given three identical bricks, and a sufficiently long ruler. Can you measure the length of the body diagonal of one brick, without using any other materials, or any formulas such as the Pythagorean Theorem?

** Please submit all solutions to David Molnar (molnar@stolaf.edu) by noon on Sunday.

If you would like to receive a copy of the Math Mess in your P.O. Box weekly, please e-mail Donna Brakke at brakke@stolaf.edu.

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