Mathematics Colloquium - October 20th

Towers Watson is a leading global professional services firm that helps organizations improve performance through effective people, risk and financial management. **Megan Foster**, an Associate of the Society of Actuaries and an Alma College alumna, will discuss her role as a retirement actuarial consultant at Towers Watson. She will give an overview of the profession, including background on retirement plans, examples of consulting projects, and information for students interested in pursuing a career path in actuarial science. Please come and learn more about this interesting and rewarding career.

"Mathematics and Actuarial Consulting"

Presenter: **Megan Foster**
Date: **Monday, October 20th**
Time: **4:00**
Place: **SAC 113**

Refreshments at 3:50.

Game Theory Course Offered in Spring

Dr. **Jimmy Peterson** will be teaching a new *upper-level* math course in the Spring Term. The course is MTH 280 (Game Theory), and the prerequisite is MTH 121 or instructor permission. Game Theory is the mathematical study of interactions involving several players (usually two), each attempting to gain the most they can by making a choice from among several options. Although the set-up just described sounds straightforward, even very basic games (interactions) can result in surprising "best" strategies for the players. We will study just what we mean by "best" strate-gies and how to go about mathematically finding them. There are many applications to economics, political science, biology, and other fields, which we will explore. John Nash famously won a Nobel Prize (and was the subject of the Oscar-winning film *A Beautiful Mind*) for his work in game theory.

Math: It's in Your Bones

Well, maybe not literally, but our bodies do play a role in how we process, make sense of, and work with numbers. Integers, decimals, and percentages are not concepts floating about our brains in isolation, nor are they belonging to the realm of theory—detached from reality. Numbers are an integral part of our world. We are perfectly aware that five books will take up more space than one, that ten pounds of fruit will be heavier than two pounds, and that twenty miles will take longer to travel than five; imagining a world without such quantification is, in fact, exceedingly difficult, but what influence do these everyday interactions with numbers have on how we learn math and process numbers in a mathematical rather than day-to-day context?

According to German Neuroscientist Florian Krause of Radboud University, our early, physical experience with numbers may play a significant role in shaping our interaction with numbers later in life. Krause claims in his thesis *Numbers and Magnitude in the Brain: Evidence for a Sensorimotor Grounding of Numerical Cognition*, that our bodies "do" math and understand the size of numbers as much as our brains do. This is why children in his study instinctively pressed harder on a button in order to raise a platform on a computer screen when the computer showed many pieces of

fruit than when the platform contained only a few; it is why it is more difficult to identify a "small" number (such as 2) as the physically largest number from a printed sheet of numbers in various font sizes.

Krause's thesis is just one piece of a growing field of research that seeks to understand how numbers are processed and thus support students of mathematics, particularly those who process numbers in unusual ways, to unlock concepts and success in mathematics. *Katie Krauss*

For more on Florian Krause's Research visit http://bit.ly/1siiURM or http://bit.ly/1snxhVj .

MATH Competition on November 1st

You are invited to participate in the 20th annual MATH Challenge, held on **Saturday, November 1st**. The MATH Challenge is a *team-oriented*, 3-hour exam consisting of ten interesting problems dealing with topics found in the undergraduate math curriculum. Teams consist of 2 or 3 students, and you'll take the exam on campus from 9:30 am to 12:30. You may form your own team or you can simply be placed on a team. Before the exam, you'll be provided with a "hearty breakfast" of waffles, bagels, donuts, and juice. If you're interested, contact Professor Sipka.

Important Meeting for Seniors

All senior Math and C.S. majors, who intend to graduate this year, are required to attend a meeting on **Tuesday, Oct. 21st** at 4:00 in SAC 216.
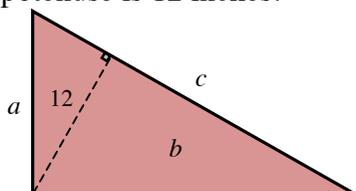
The Math Club

The next meeting of the Math Club will be **Wednesday, Oct. 22nd** at 10 pm in DOW 132. *Everyone is invited*.

Solution to Previous Problem

The length of the perimeter of a right triangle is 60 inches, and the length of the altitude perpendicular to the hypotenuse is 12 inches.

Find the lengths of all three sides of the triangle.

Dalton Potter won the $2 prize for the previous problem. He began with 3 equations: (1) $ab = 12c$, (2) $a + b + c = 60$, and (3) $a^2 + b^2 = c^2$. He then reduced these to a single equation in terms of c and found $c = 25$. He then found $a = 15$ and $b = 20$. **Isaac Burrell** also submitted a correct solution.

Puzzle of the Bi-week

Two players, *A* and *B*, take turns playing the following game. There are six toothpicks on the floor. At each turn, a player takes one or two toothpicks from the set of toothpicks remaining on the floor. The player who removes the last toothpick from the floor WINS. Player *A* makes the first move. Is there a *strategy* that *A* or *B* could use that would *guarantee a win*? If so, please explain.

A prize of **$2.00** will be awarded to the FIRST student who submits a correct solution to Prof. Sipka.

Student assistant:	Katie Krauss
Faculty advisor:	Tim Sipka
Distribution:	Deb Smith

If you would like to submit an announcement or a short article, please send it via e-mail to Tim Sipka (sipka@alma.edu).