Newsletter
for students in
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1 Introduction
by Dr. Sarah Holliday

This semester has been particularly busy for our Math majors, especially the 14 in the capstone class! Ten students went to the SouthEastern MAA meeting in Morrow, GA at Clayton State over Spring break, where they participated in the Math Treasure Hunt, competed in Math Jeopardy, viewed the Poster session, attended talks, including the talks given
by SPSU folk! Trevis Elser gave the talk “Removing Constant Volatility From The Black-Scholes Model” The Black-Scholes Model is a classical model for predicting the price of European Style options. There are a number of assumptions that this model is built around. Of particular interest is the assumption of constant volatility. Since this assumption is not realistic I am examining the results of removing the assumption. In order to achieve this goal the constant volatility is replaced by a number of periodic functions and the results analyzed. Dr Griffiths talked about his work with Daniel Karasek, “Permutation Ups and Downs” Descents and Inversions are long studied permutation statistics, their properties well documented. Two of these properties are log-concavity and the real zero property (that all zeros of the generating polynomial are real and negative), of which the former is shared by both descents and inversions, while the latter do not have the real zero property. What sort of measure is ‘in between’ these two statistics, and where is the real zero property lost? We share our most recent discoveries, including projects recently assisted by and accessible to undergraduates. Dr Holliday gave recent results on “CNUC Graphs”, her current research topic.

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It is possible to divide a right triangle into smaller triangles so that all of the smaller triangles have only acute angles.

The right triangle pictured has been dissected into 13 smaller acute triangles. What is the
The smallest number of acute triangles that this right triangle can be dissected into?

Send your solution to sedwards@spsu.edu, or by snail mail to Steve Edwards in the Math Department. The names of the first solvers will be posted at fac-web.spsu.edu/math/stinger/132.htm.

3 Dr. Meg Dillon receives Fulbright Specialists Award
April 4, 2012 Hornet’s Nest

Dr. Meighan I. Dillon, professor of mathematics, has been selected to participate in a Fulbright Specialists project in France by the United States Department of State and the J. William Fulbright Foreign Scholarship Board.

The Fulbright Specialists Program provides short-term academic opportunities to prominent U.S. faculty and professionals to support curricular and faculty development and institutional planning at post secondary, academic institutions around the world.

Dr. Dillon, who will be at the Université de Technologie Belfort-Montbéliard (UTBM) for most of May and June, will teach a mathematics course in the institutions English language program. She will also give a series of lectures on mathematics history and pedagogy.

Dr. Dillon has visited the French institution twice since 2010 and hopes that this project paves the way for more exchanges between students and faculty at SPSU and UTBM.

A member of the SPSU faculty since 1992, Dr. Dillon has written research articles on infinite dimensional Lie algebras, co-authored an upper-division textbook on geometry, and is now developing a project with a Chicago artist. Dr. Dillon was SPSUs 2000-2001 Teacher of the Year.
Suppose that 20 red dots and 20 green dots are randomly put on a piece of paper. Is it always possible to draw straight line segments so that each red dot is joined to one green dot, and so that none of the line segments intersect? If so, why? If not, why not? Assume
that the dots are geometric points, so that they have no size, only position. Also assume
that “randomly” means that no three dots are on the same straight line. Otherwise we could
have this:

Send your solution to sedwards@spsu.edu, or by snail mail to Steve Edwards in the Math
Department. The names of the first solvers will be posted at
fac-web.spsu.edu/math/stinger/138.htm.

5 Math Stinger # 139
by Dr. Steve Edwards

Sam Slow is making a round trip from Atlanta to Nashville and back. He wants to have an
average speed of 70 mph, but the traffic is so bad that Sam’s average speed from Atlanta to
Nashville is only 35 mph. How fast must Sam drive from Nashville to Atlanta to have an
average speed of 70 mph for the whole trip? Note that the distance is irrelevant.

Send your solution to sedwards@spsu.edu, or by snail mail to Steve Edwards in the Math
Department. The names of the first solvers will be posted
fac-web.spsu.edu/math/stinger/139.htm.

6 Academic Experiences Outside of Class: Tutoring
and Jeopardy
by Trevis Elser

There are plenty of ways to socialize and pursue extra-curricular activities on campus. But
what about things that are good for that and still helpful to your academic career? Overall
there are many ways to gain additional insight on material, but I’d like to talk about two that
I have found and enjoy, Tutoring and the Mathematical Association of America’s Jeopardy.
Tutoring has been a massively positive thing for me. I do not know if I could stress enough
the impact that it has had on me both as a student and has a person in general. Personally, I
have done both private tutoring and tutoring for the school. Doing either is a great academic
experience. This is through, an additional viewing of the material, teaching the material,
and the interactions with others who are having a difficult time with the material.
By taking a second look at the material, a deeper understanding of the material can be
obtained. This stems from a number of things. Firstly, by tutoring a subject that may not
be the freshest material for you, additional connections to courses since may be obtained.
Also, techniques and new ways of approaching problems from later courses can make older
problems appear in a new light.
Explaining course content to someone else also has a range of benefits. By explaining the
material to someone else, you are forced to reevaluate it yourself. Not necessarily just in
preparation, but as the explanations are taking place, especially if multiple explanations are

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required. Some of the previous benefits also come at the time of going through the content with someone else, such as being forced to come up with a new approach to explain a problem or concept to someone.

The interactions with others, which have already been touched on some, are also very important. Not only do you have to explain the material to someone else in a way that they can understand, but you also have to be able to answer their questions. That is not meant to be scary, but by being asked questions that may come from a different way of thinking, then that forces you to think about the same problem in those other different ways. By trying to place yourself in someone else’s way of thinking about things, you can gain not only a better insight into why they might be having a hard time understanding the material at hand, you also gain a better feel for the material yourself.

Now, as for jeopardy, if anyone reading this does not know that the student chapter of the Mathematical Association of America (MAA) competes in a regional mathematics jeopardy competition every year, well you do now. This competition is a team based sport and the MAA, which I am the exiting president of, is always looking for participants. The material used in the competitions is not extremely “high” in the sense that it is not senior level course material. However, the material is not necessarily easy, nor is the pace of the competition very slow. By participating in this however, you will be forced to become quick in the areas covered. This is a great skill to have; certainly if you plan on taking the subject GRE. Also, should you start Jeopardy early enough in your mathematics courses you can be exposed to some topics, such as Linear Algebra and Differential Equations before you get to them. So Jeopardy can be an extremely fun way to get extra academic experience.

There are two great academic opportunities that are awaiting many students. Jeopardy is a fun activity that can be great for gaining speed and additional knowledge from classes you have yet to take. There is great insight to be gained from tutoring, even ignoring the benefit of helping others. Tutoring and Jeopardy are both great ways of gaining extra insight and experience. Oh and the tutoring money is not bad either.