The Oklahoma/Arkansas MAA Undergraduate Competitions

By Michael Scott McClendon

It sometimes feels next to impossible to generate excitement about mathematics amongst a group of undergraduates majoring in, say, biology. It can be almost as difficult to generate excitement amongst a group of mathematics majors. But it can be done. The Oklahoma/Arkansas section of the MAA just completed a first yearly undergraduate mathematics competitions. We were overrun by students eager to participate. We had 14 teams competing, 30 students competing in an integration bee and 20 students presenting research papers.

This competition really began when a student activities committee was formed: me, Fred Worth of Henderson State University, and Kathy Pinzon of the University of Arkansas at Fort Smith. It was early in the fall semester when I sat down at my computer and about one week later had a six-page proposal written of what I envisioned a great competition would entail. I sent it to Fred and Kathy, who were both excited about it. Kathy saw to it that the section governance saw the proposal. The total cost to the section was projected to be under $600. The actual cost this year was roughly $575. This includes three $75 awards, $300 for food and $50 for incidentals. But we collected about $150 in registration fees, so the cost to our section was really about $425.

The first, and major, part of the proposal was an undergraduate team competition. The universities in our section were allowed to send one or more teams of two or three students. Allowing teams of two made it possible for smaller universities to participate; in the end, seven of the teams had two students and another seven had three.

After I was fairly confident how the competition would run, I obtained a list of every institution of higher learning in Oklahoma and in Arkansas. I went to their web pages and hunted down the phone numbers to the chairs of their mathematics departments and I called every single one of them, telling all of the chairs about the competition coming up in Weatherford, Oklahoma.

The last minute details were worked out about a week before the actual competition. My colleague Charles Cooper and I met with section chair Gerry East and professor emeritus Stewart Burchett at Southwestern Oklahoma State University (SWOSU) in Weatherford. We arranged the room so that each team would have a table and so that there was plenty of seating around the periphery for faculty mentors to sit and watch the competition.

The team competition was a *Jeopardy* style competition. Teams were given 75 seconds to solve each question. We used clickers: the team that clicked first and provided the correct solution would then select the next question from the grid of questions displayed on an overhead projector. If the team got a correct answer, they would get the number of points that was listed on the grid. If they clicked their clicker and got the wrong answer then they lost one point. If a team did not click their clicker at all then they they received 0 points. A colleague of mine at UCO, Larry Lucas,

SERIOUS CALCULUS 1	SINE LIMITS 1	ALGEBRA 1	HISTORY 1	MISC. 1	LIN ALGEBRA 1
SERIOUS CALCULUS 2	SINE LIMITS 2	ALGEBRA 2	HISTORY 2	MISC. 2	LIN ALGEBRA 2
SERIOUS CALCULUS 3	SINE LIMITS 3	ALGEBRA 3	HISTORY 3	MISC. 3	LIN ALGEBRA 3
SERIOUS CALCULUS 4	SINE LIMITS 4	ALGEBRA 4	HISTORY 4	MISC. 4	LIN ALGEBRA 4
SERIOUS CALCULUS 5	SINE LIMITS 5	ALGEBRA 5	HISTORY 5	MISC. 5	LIN ALGEBRA 5

The Jeopardy-style grid of question topics. Created by Michael Scott McClendon.

handled the clickers.

A team would click their clicker and work out their answer and hand it either to Fred Worth or to John Diamantopoulos from Northeastern State University or occasionally to Bill Sticka from SWOSU. Both John and Bill volunteered to help out and their efforts proved to be invaluable. We decided to ask questions with short answers plus a scant few multiple choice questions.

Students in action at the Team Competition, with interested faculty in the background. Photograph by Charles Cooper.

Immediately after time was called for each question, I would show a PowerPoint slide that had the solution to the question worked out. It was always amusing to hear all of the sighs, all the half-chuckle, half-groans and the small yelps of elation as the students realized they had either missed or correctly answered the questions. The 50 minutes just flew by.

As we had 14 teams, we randomly selected seven of them to compete from 6:00 pm to 7:00 pm, seven to compete from 7:00 pm to 8:00 pm, and then the two teams from each hour with the highest score were to compete in the final round from 8:00 pm until 9:00 pm. While this makes for a long evening we made sure to have plenty of pizza and soda available.

During the competition, Charles Cooper took a fantastic collection of photographs. I made sure that I had a picture taken with the winning team from the University of Oklahoma, and the two undergraduate students on this team, Logan Maingi and Ruozhou Liao.

The integration bee was set to begin at 9:00 pm after everybody was finished with the team competition. A lot of the students enrolled in the team competition were also enrolled in the individual competition. I believe the winning integral was $\int \frac{\cot x}{1+\sin x}\,dx.$ An Oklahoma State University student, Markus Vasquez, won the integration bee tournament.

On the following Friday afternoon, we had the undergraduate papers session. I worked with our section Secretary Lee Turner (Southern Nazarene University) to help divide up the submitted papers and abstracts into various topical categories. (Without all the support that I got from Lee, absolutely none of this could have taken place.) This year, the categories we chose were "Differential Equations," "Applied Mathematics," "Graph Theory" and "General Undergraduate Papers." There would be at least two judges for each category. However, we could not award first place winners in the Presentation Competition because right in the middle of the student paper presentations, the sectional meeting was cancelled due to a major snowstorm that had just barreled down out of the north.

Now that the competition is over, I reflect back upon it and wonder how it could have been any better. Everybody was in great spirits; every single one of the students that I talked to said pretty much the same thing — they had a great time. Both John and Fred brought humor and jollity to the event that wonderfully lightened up the atmosphere.

If anybody would like a copy of all of the questions that we used in the team competition or if you would like a copy of the proposal that Kathy ran by our governance that was approved and implemented into a successful mathematics competition, just email me at mmcclendon@uco.edu. If there is currently no such competition in your section, this might be close to a good place from which to begin. Any such program would be fantastic for your undergraduates' excellence in mathematics. Let the excitement begin!

Scott McClendon received his PhD in mathematics from the University of Louisiana in Lafayette in 2000. He is now a professor in the Department of Mathematics and Statistics at the University of Central Oklahoma. His research interests are typically geometrical in nature. He likes to spin classical music LPs and rock and roll LPs with his wife Ginger.