

# High School Mathematics Workshop Series

## Fall 2002

During the Fall semester 2002, this program made presentations for middle school and high school mathematics teachers at a MESA in-service day and we held two mathematics workshops for high school students. The topics of the workshops were Graph Theory and Probability and Game Theory.

MESA (Mathematics, Engineering, Science Achievement) is a program which encourages successful middle school and high school minority students to attend college and to major in a technical field. Each participating school has a teacher representative. On October 15, 2002, these teacher representatives had an in-service day at the U of A in order to learn more about activities they can do with their students. We gave two separate presentations, one to middle school instructors and one to high school instructors. The middle school presentation was given by Lisa Berger and consisted of probability games the teachers could do with their students. The high school presentation was given by Katrina Piatek-Jiménez and involved a project for finding the rate of change of a tootsie-roll pop as one sucks on it. Information about both projects are currently stored in Math 318. The university contact person for the MESA program is Raphael Meza (rmeza@arizona.edu).

The Graph Theory workshop took place on November 15th from 10am-3pm. The students were from Douglas High School in Douglas, Arizona. The teacher contact was Denise Kroll. The graduate student who organized the workshop was Derek Habermas and the other graduate students involved were Ben Levitt, Patrick Shipman, Frederick Leitner, Craig Beisel, and Jennifer Lowe. We also had an undergraduate math major come and speak with the students for 20 minutes about what he has done as a mathematics major and to answer a few questions the students had. The undergraduate student was David Brown. Dr. Bruce Bayley also provided a demonstration at the workshop in which he discussed the mirror lab located at the university.

The Graph Theory topics covered during the workshop were:

- Euler circuits (Craig and Derek)
- 4-color map theorem (Patrick)
- Instant Insanity (Derek)

The Party Problem/Ramsey Theory (Craig)  
Spanning Trees/soap bubble computer (Frederick)

The Probability and Game Theory workshop took place on November 22nd from 10am-3pm. The students were from Howenstine High School, on Tucson Blvd. The teacher contact was Louise Bailey-Jones (Tsuru.Bailey@tusd.k12.az.us). The graduate students who ran the workshop were Adam Spiegler and Katrina Piatek-Jiménez. The other graduate students involved were Sacha Swenson, Sarah Frey, Sam Chapman, Frederick Leitner, and Jeanine Smallwood. Dr. Bruce Bayley also did his presentation about the mirror lab for this workshop as well.

The Probability and Game Theory topics covered at this workshop were:

“BINGO” and the Human Pinball Machine (Pascal’s Triangle) (Sarah)  
Dice and Tile Games (Katrina)  
Strategy Based Games (Sacha, Adam, and Fredrick)  
Dots and Boxes Game (Jeanine and Sam)