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Avon Resident and Ashland University Student Participates in Institute

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ASHLAND, Ohio -- Avon resident Anna Payne, who is a senior at [Ashland University](http://www.ashland.edu), participated in the Summer Undergraduate Mathematical Science Research Institute (SUMSRI) at Miami University in Oxford, Ohio.

Payne, a graduate of Avon High School and the daughter of Martin and Karen Payne of Avon, discovered the program through the Research Experience for Undergrads list on the National Science Foundation website. She was one of 17 applicants chosen for the program.

SUMSRI is an intense mathematical research program that pushes students to learn more about advanced topics in math and explore different ways of solving problems. The program is an opportunity for the students to see what mathematical research is really like.

In the program, students were split into groups: Discrete Math/Graph Theory, Algebra and Statistics, and each group had to research mathematic topics. Payne was chosen for the Discrete Math/Graph Theory group, and along with her teammates, conducted graph theory research on tournaments.

Payne said they worked to prove conjectures given in other papers about transitive tournaments. In the mathematical field of graph theory, transitive tournaments are directed, complete graphs with particular properties. Their name is derived from the fact that each one of these graphs can be thought of as the results of a round robin tournament in which if Team A beat Team B and Team B beat Team C, then Team A beat Team C.

In the final week of the program, Payne’s team wrote up their results in a formal paper and made a final presentation.

Payne was happy with the success of her research.

"Our research was pretty successful, and we have proved several things that had not been proven before," she said. "The program has definitely helped me grow as a mathematician. It is great working with people who have similar interests and a passion for mathematics. Everyone here, including myself, is serious about their pursuits in mathematics."

Payne credits [Ashland University](http://www.ashland.edu/) classes such as Discrete Math I and II (proof-writing and some basic graph theory understanding), as well as Computer Programming I and II, Mathematical Software, Linear Algebra, Probability, and Calculus I, II and III for helping her succeed in the program.

She also acknowledged that her membership in Ashland University's Problem Solving Group (PSG) helped her in the program.

"PSG teaches us to think differently about problems and use a variety of methods to handle seemingly difficult problems,” Payne said. “For me, that was very useful here because a lot of times, the method of solving a problem is not immediately obvious."

Along with the research projects, students in the program were offered short courses in Abstract Algebra, Real Analysis, Mathematical Writing, and GRE Preparation during the program. These were challenging courses, but gave the students an opportunity to learn even more about mathematical research.

Payne plans on graduating with a double major in [Integrated Mathematics and Mathematics with a minor in Computer Science](http://www.ashland.edu/departments/math-computer-science). After graduation from AU, she plans to go to graduate school for Mathematics or Applied Mathematics.

Ashland University, ranked in the top 200 colleges and universities in U.S. News and World Report’s National Universities category for 2012, is a mid-sized, private university conveniently located a short distance from Akron, Cleveland and Columbus, Ohio. Ashland University ([www.ashland.edu](http://www.ashland.edu/)) values the individual student and offers a unique educational experience that combines the challenge of strong, applied academic programs with a faculty and staff who build nurturing relationships with their students.

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