

## UNDERGRADUATE MATH SEMINAR

This week's math seminar will be back at its usual time and location.

**DATE:** **THURSDAY, February 13**

**Time &** **12:30 – Refreshments in Bailey 204**

**Location:** **12:50 – 1:45 Seminar in Bailey 207**



Professor Julius Barbanel

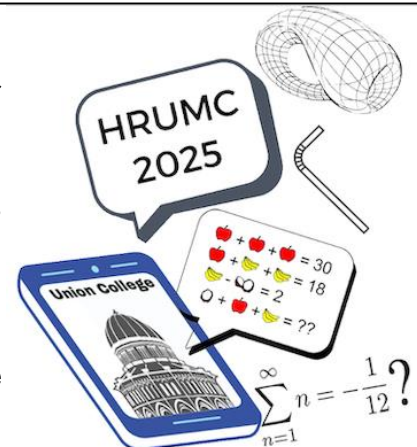
**Title:** **The Euclidean Algorithm and Irrational Numbers**

**Abstract:** The Euclidean Algorithm is a procedure for determining the greatest common divisor of two positive integers. Irrational numbers are real numbers that cannot be expressed as the ratio of two integers. These two ideas certainly do not seem to be related, but we shall explore a rather surprising historical connection between them. This exploration will include a quick tour of ancient Greek mathematics.

## HRUMC – Saturday, April 5, 2025

The Union College Math Department will be hosting this year's Hudson River Undergraduate Mathematics Conference (HRUMC) on **Saturday, April 5<sup>th</sup>**.

The HRUMC is a one-day mathematics conference held annually each spring, attended by students and faculty from colleges and universities throughout New York and New England. It was founded by four colleges, Siena, Skidmore, **Union**, and Williams, with the goal of providing undergraduates with the experience of attending and/or presenting at a professional mathematics meeting and was designed primarily with the student in mind. It is a premier regional undergraduate math conference after which many others have been subsequently modeled nationwide.



Students who have attended HRUMC generally rave about the experience, saying how great it was to support the Union speakers, to meet students from other colleges, and to hear about some exciting math that students and faculty at other schools are doing. It is also a great way for underclass math majors to start thinking about their own math theses.

The conference features short, 15-minute talks *primarily by students* and faculty, as well as a longer invited address by a noted mathematician. This year's keynote address will be by **Professor Álvaro Lozano-Robledo**, a number theorist from the **University of Connecticut** with a large social media presence, and is entitled **Math in the Age of Social Media**.

There will also be lunch panels themed for students: "Making the Most of One's Undergraduate Mathematics Experience" and "What can I do with a math degree?"

Conference registration and talk/abstract submission is through the HRUMC website, [HRUMC](#) (google it!)

Sound interesting?

- To **volunteer** at the conference, contact any of the three students on the HRUMC steering committee as soon as possible: **Audrey Benson** ([bensona2@union.edu](mailto:bensona2@union.edu)), **Frankie Morone** ([moronef@union.edu](mailto:moronef@union.edu)), **Tremaine Richardson** ([richardt@union.edu](mailto:richardt@union.edu))
- To **present a talk** (based on summer research, a thesis, a project, or problem you enjoyed, etc.) contact a math faculty member to sponsor it. Then register by **March 16**.
- To simply **attend**, register by **March 31**.

## Math Student-Faculty Paper Accepted for Publication

A paper co-written by **Professor Rylan Gajek-Leonard** of the Union College Math Department and his recently graduated senior thesis student, **Uri Tomer '24**, was recently accepted for publication in the *The American Mathematical Monthly*. “The Monthly,” as it is commonly known, “is an international, peer-reviewed journal that publishes high-quality, original expository research. It is read by a diverse and global audience of PhD students, faculty, and math enthusiasts,” according to its website.

### STRETCHING NEWTON POLYGONS USING PURE POLYNOMIALS

RYLAN GAJEK-LEONARD AND URI TOMER

**ABSTRACT.** The  $p$ -adic Newton polygon is a visual tool that encodes information about the roots and factorization of a polynomial relative to a prime  $p$ . In this article, we investigate how the Newton polygon changes under polynomial composition. If  $f$  and  $g$  are polynomials with rational (or  $p$ -adic) coefficients and the Newton polygon of  $g$  is pure (has only one segment), we show under some mild conditions that the Newton polygon of  $f \circ g$  is the same as that of  $f$ , but stretched horizontally by  $\deg g$ . When  $f = g$ , this implies that all iterates of certain pure polynomials are irreducible, recovering a classical result of Robert Odoni on the irreducibility of iterated Eisenstein polynomials.

Uri worked on a two-term thesis with Professor Gajek-Leonard, a number theorist, in Fall 2023-Winter 2024. The efforts resulted in a paper entitled “Stretching Newton Polygons Using Pure Polynomial.” If you are interested in reading a sneak preview of the paper before its official publication date in The Monthly, you may find it on the “Arxiv” [here](#). Congratulations!

## Summer Job in Math with AOP!

The Academic Opportunity Program (AOP) is looking to hire two summer tutors/community advisors in math, one for precalculus and one for calculus. For more information, follow the QR code in the advertisement to the right, or contact Julissa Boyer (boyerj2@union.edu) in the AOP office.

## Math Clubbing!

- **Association for Women in Mathematics (AWM).** The next meeting of the Union chapter of AWM will be **Thursday, February 13 at 3:00pm** in the **Math Common Room, Bailey 204**. All are welcome!

Free Peer Tutoring in Calculus Courses

*CALCULUS HELP CENTER!*

Sunday - Thursday: 7:30 – 10:00pm

Sorum House Seminar Room

Looking for Paid Summer Work?

# AOP SUMMER

LOOKING FOR:

## TUTOR/COMMUNITY ADVISOR(S) & RESIDENT ADVISOR!

AOP is hiring TCAs for the following subjects: Political Science, English, Computer Science, Chemistry, and Math.

**APPLICATION DEADLINE**  
**SUNDAY FEB 16, 2025**

Job Description	Application Form
	

**QUESTIONS? EMAIL JULISSA  
AT BOYERJ2@UNION.EDU!**