**Vincent Tran**
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## Education

2023-27 BA in Mathematics, University of Chicago GPA: 3.853

### Directed Reading Programs

2025 Worked with Dickinson Instructor Justin Campbell to read Etingof's Introduction to Representation Theory and gave a presentation.

2024 Worked with grad student Samanda Zhang on Marcus's "Number Fields" and gave a presentation.

2023 Worked with grad student Suraj Dash on Lorenzini's "An Invitation to Arithmetic Geometry" and gave a presentation (UT Austin)

### Math Classes

| | *(Undergrad/Grad) Title, Grade* | *Professor* |
|---|---|---|
| 2025-25 | (U) Riemannian Geometry | Li |
| 2025-25 | (U) Algebraic Number Theory | Schlank |
| 2024-25 | (U) Math 25400-25500 Honors Basic Algebra, A | Rudenko |
| 2024-24 | (U) Math 27000 Basic Complex Variables, A | Wilkinson |
| 2024-24 | (U) Math 29700 Proseminar in Mathematics on Scissors Congruence and Algebraic $K$-Theory, A | Rudenko |
| 2024-24 | (U) Preliminary Arizona Winter School Program on Local Fields | |
| 2023-24 | (U) Math 26300 Algebraic Topology, A | May |
| 2023-24 | (G) Math 38405 Arithmetic Combinatorics, P | Razborov |
| 2023-24 | (U) Math 24400 Introduction to Algebraic Geometry, A | Rudenko |
| 2023-24 | (U) Math 20700-900 Honors Analysis in $\mathbb{R}^n$, A, A, B+ | Wilkinson, Souganidis, Csörnyei |

### PROMYS Math Summer Camp

2023 Did advanced seminars on Primes and Zeta Functions and Modular Forms; Research Lab on "Counting Lattices for Fun and Profit"; Also gave a Minicourse on Ideals and Applications

2022 Took a course on Elliptic Curve Cryptography; Research Lab on Integer Complexity

2021 Discovered Number Theory Through PSETS; 3 weeks of Galois Theory; Exploration Lab on Calkin-Wilf Tree

## Professional

### Work Experience

University of Chicago Math REU, Full Program, Chicago IL

2024 Mentored by Vladimir Drinfeld and studied algebraic geometry, representation theory (finite groups, $k$-algebras, Weil representation and Heisenberg group, $\mathfrak{sl}_2(\mathbb{C})$, and $\mathrm{GL}_2(\mathbb{F}_q)$), and linear algebra.

### Teaching

2024 Grader for Abstract Linear Algebra

## Research

2023-24 Higher a-numbers in $Z_p$-towers via Counting Lattice Points
Collaborators: Jeremy Booher, Jack Hsieh, Rakesh Rivera, James Upton, Carol Wu

Goal was to show that a region of interest to our mentors is a quasi-polynomial in one parameter

Showed the initial claim was false, but was true for sufficiently large parameters

2022 Integer Complexity Generalizations in Various Rings
Collaborators: Angeline Peng, AJ Kumar
Currently being edited after having gone through peer review

Explored novel generalizations of Mahler-Popkens integer complexity

Established bounds on these generalizations

Used tools from Galois theory and Cyclotomic Polynomials to look at the complexity of 1

## Projects

2023-Present Hartshorne's "Algebraic Geometry" Solutions
Reading and doing every exercise in Hartshorne Chapter 2. Currently on Section 4.

2023-Present Atiyah-Macdonald's "Introduction to Commutative Algebra" Solutions
Reading and doing lots of exercises in Atiyah-Macdonald. Currently on Chapter 4.

## Awards and Certifications

2023 Presidential Merit Scholarship from University of Chicago
2020-2022 USA Mathematical Talent Search Honorable Mention
2021-2022 American Invitational Mathematics Examination Qualifier
2022 Stanford Math Tournament Honorable Mention

## Skills

### Languages

Spanish, Vietnamese

**Programming Languages**
Java, Python

**Design Languages**
LaTeX

**Programs**
Expertise in Vim, Unix and utilities
Experience in Eclipse, Android Studio, GitHub, Mathematica, Sage, Inkscape