

# Mathematics Orientation!

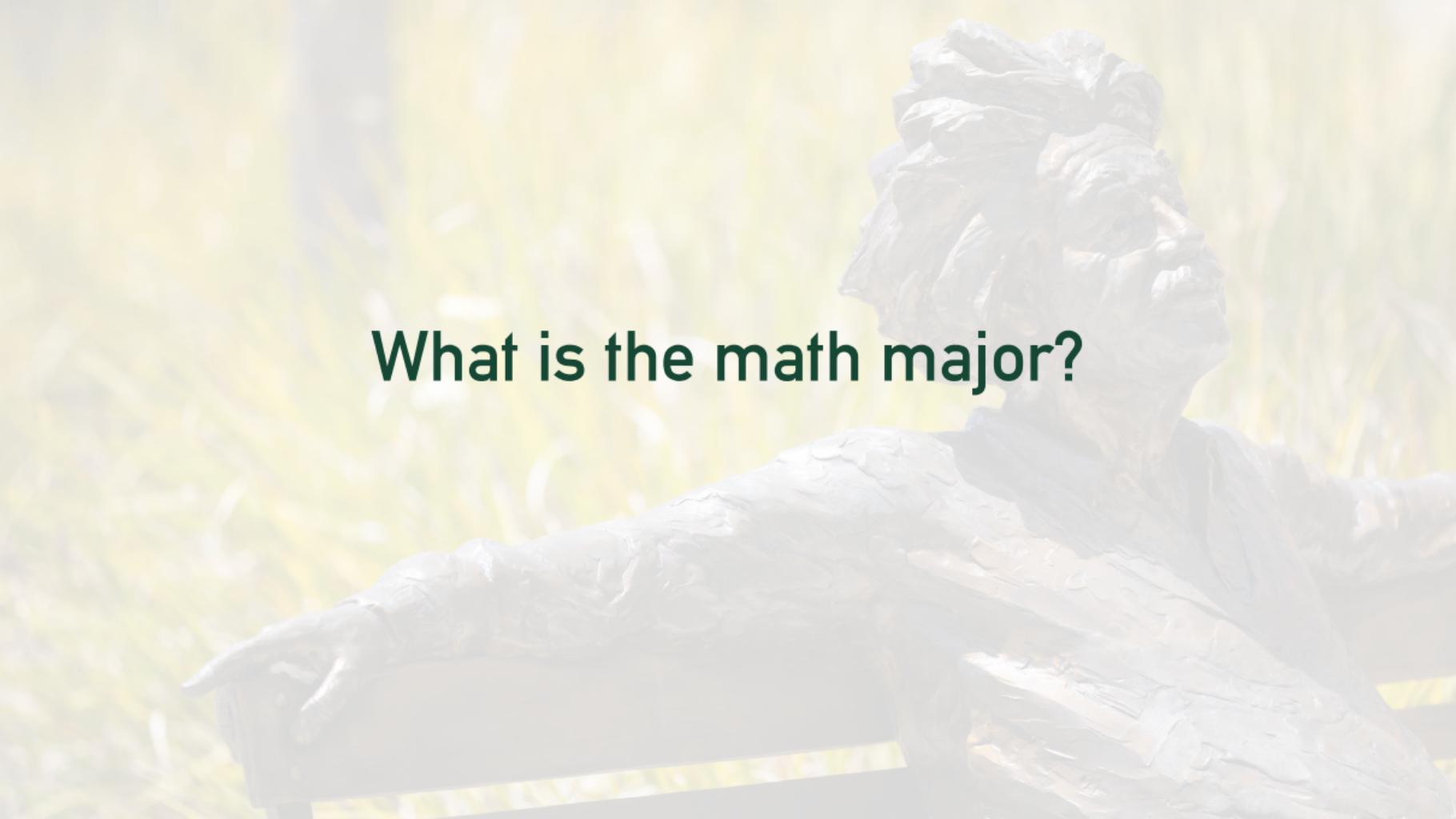
---

Professor Tony Mendes  
Cal Poly Mathematics Department

## Who are you?

---

1. Why are you a mathematics major?
  
2. Do you have a career direction?

A large, sprawling pile of crumpled black plastic bags, possibly trash or recycling, occupies the lower half of the frame. The bags are tightly packed and layered, creating a textured, dark shape against a bright, out-of-focus background.

# What is the math major?

# Mathematics is not calculations!

---

Mathematics majors

- Explain why things are true (that is a proof!)
- Engage in abstract and creative problem solving
- Know the foundations of adjacent subjects (Phys, CS, Stats, Econ, Eng,...)

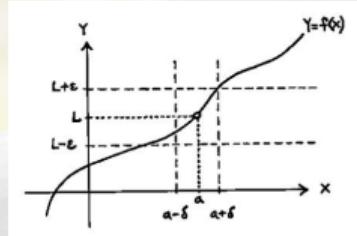
## Cornerstone mathematics courses:

---

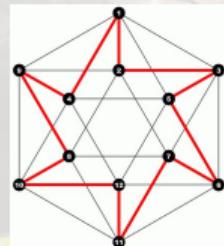
- Linear Algebra (Math 206/306/406)



- Real Analysis (Math 412/413/414)



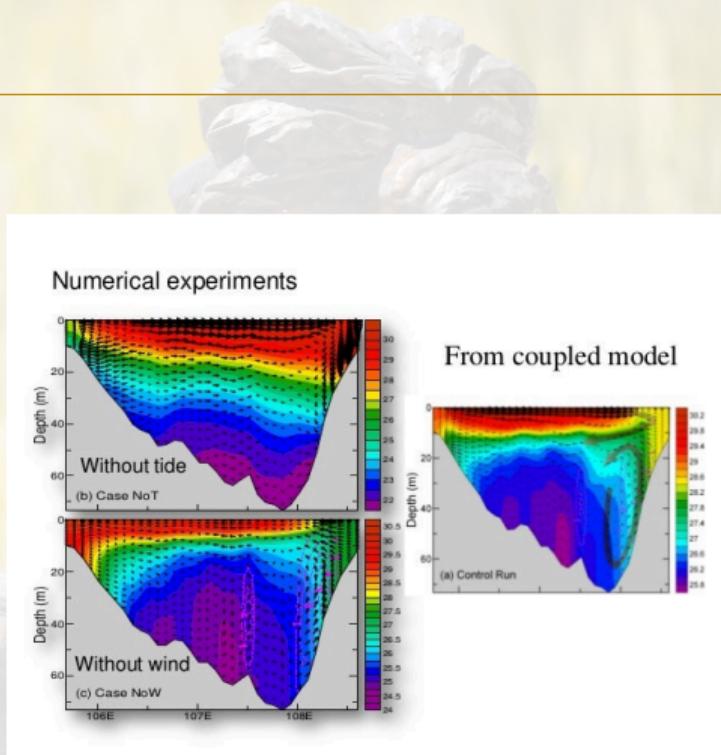
- Abstract Algebra (Math 481/482/483)



# We have many excellent offerings

---

- Differential Equations (Math 242/344/416/418)
- Combinatorics/Graph Theory/Discrete (Math 334/335/435)
- Geometry/Topology (Math 404/440/442/443)
- Numerical Analysis/Optimization (Math 451/452/453)



# The major is more than coursework!

- Research/senior projects with faculty
- Funded travel to math conferences
- Competitions
- Mathematics tutoring/workshop/grading jobs
- Clubs/Math lounge/community



## What is mathematics research?

---

Applied research models real-world phenomena, such as

- The paleoclimate
- Action potentials (signals) through cardiac tissue

“Pure” mathematics research involved proving new mathematical facts:

- How many ways can  $1, 2, \dots, n$  be permuted such that “1423” is avoided?
- What is the relationship between Poncelet’s porism and elliptic curve geometry?

Math education has research projects as well.

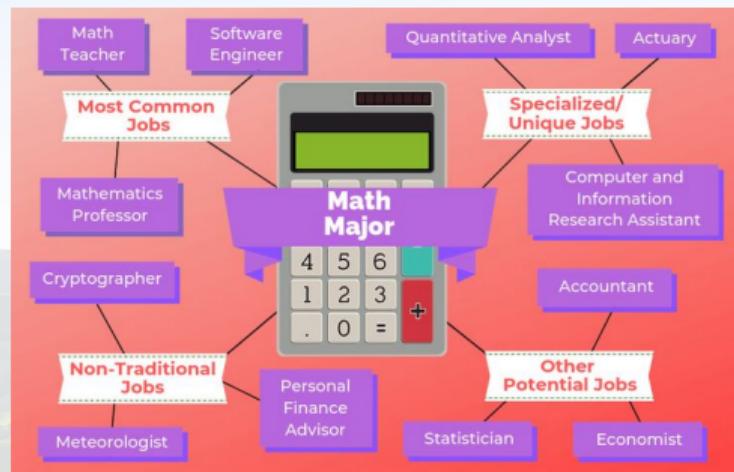
A scenic landscape featuring rolling green hills under a clear blue sky. The foreground is filled with tall, green grass and wildflowers. In the background, more hills stretch towards the horizon under a bright sun.

**Everything has Pros and Cons**

# Math Major Pros

---

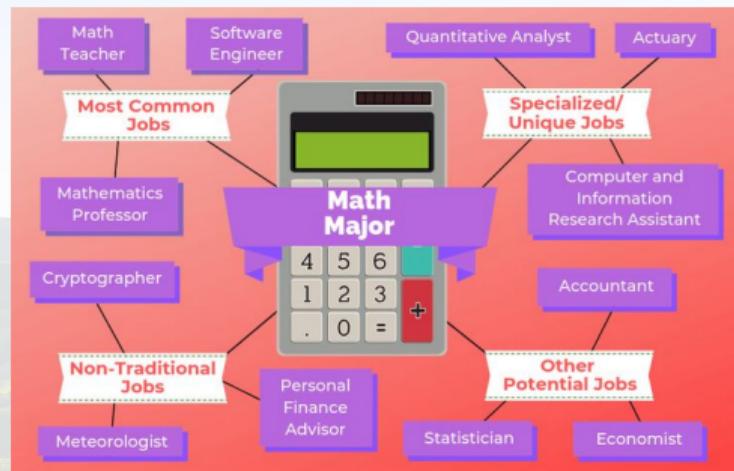
- Superior logic and reasoning
- Varied career options, many minors
- Interesting and intellectually challenging
- High demand for K-12 teachers, CSET waiver



## Math Major Cons

---

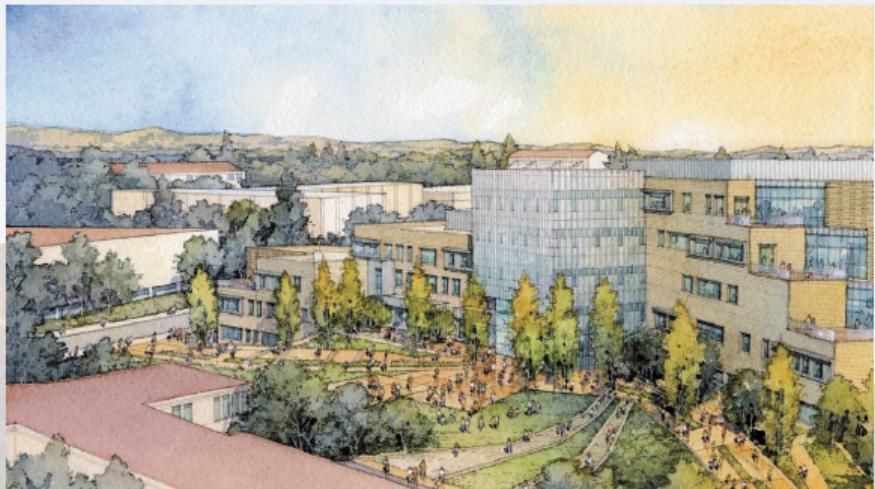
- General purpose major, not trained for anything specific
- Need to sell your abilities to get first job
- Not what some expect (abstract, proofy)
- PhD/academic career path is extremely challenging



## Cal Poly Math Major Pros

---

- Wide variety of courses/research opportunities
- Small classes/large faculty
- 4 + 1 program/grad school prep
- Department level scholarships
- Tutoring/grading/workshop job opportunities

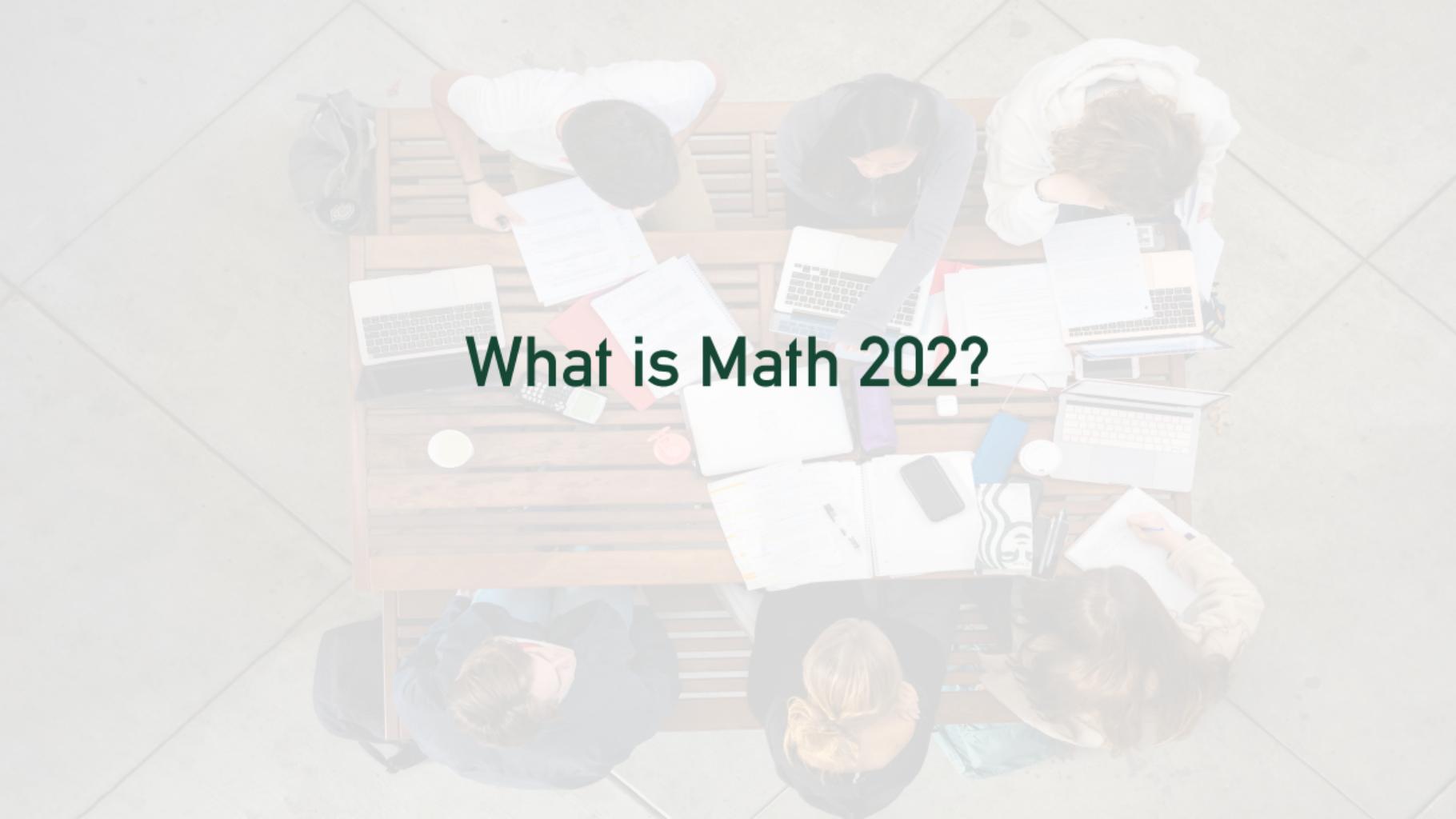


## Cal Poly Math Major Cons

---

- Course planning is confusing
- Some facilities are dated/not optimal
- Cal Poly/SLO can be expensive
- Scant local career opportunities





# What is Math 202?

## What is Math 202?

---

- Guest speakers will come (please talk to them!)
- Write resume and visit the job fair (sign up soon!)
- Create a valid graduation plan

## What is Math 202?

---

Course information is on Canvas and

<https://anthonymendes.github.io/202.html>