

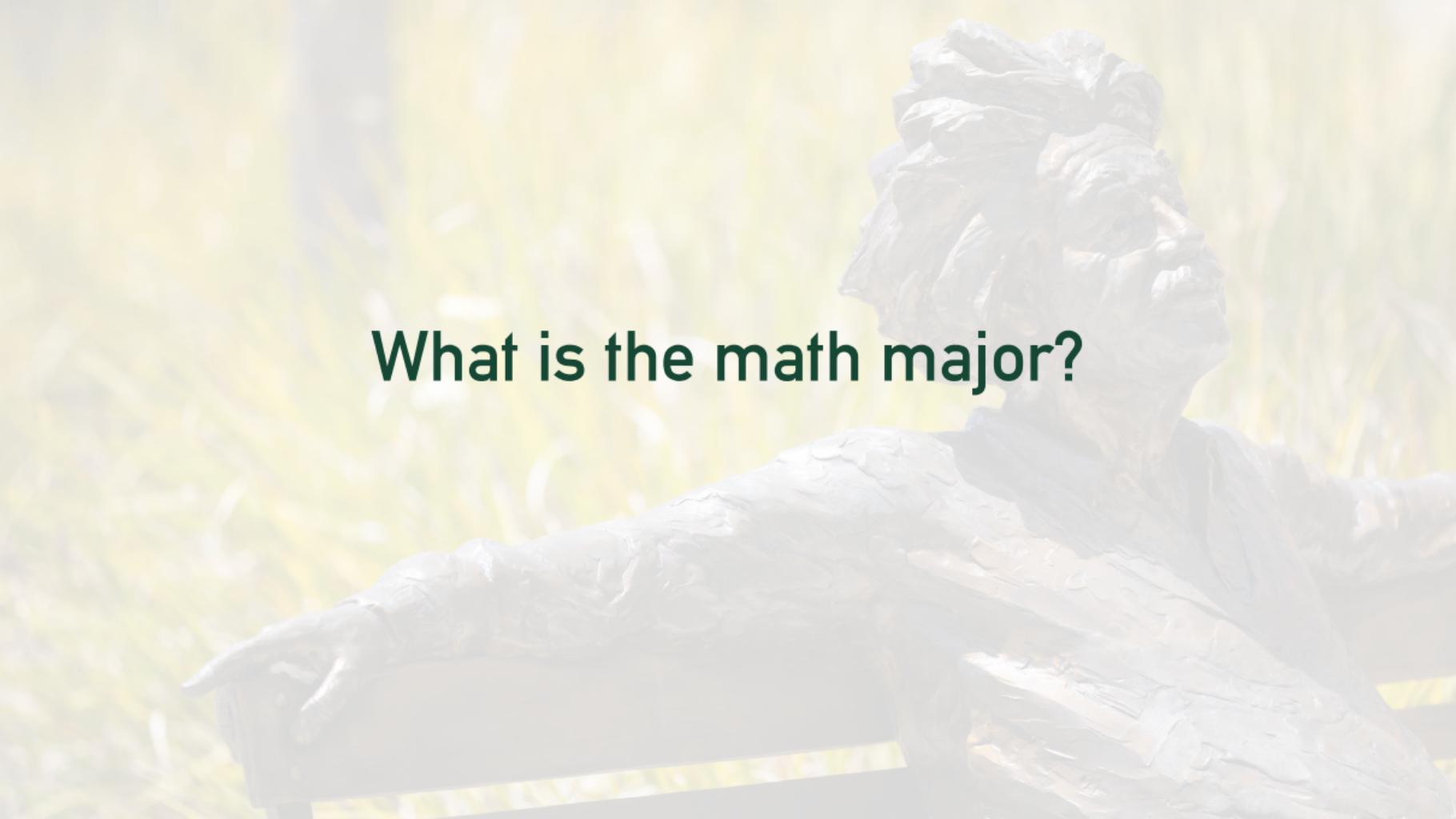
Mathematics Orientation!

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, translucent plastic bags dominates the foreground and middle ground of the image. The bags are piled high, creating various textures and folds. In the background, there are more bags and some yellow foliage, suggesting an outdoor setting like a trash dump or a field.

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 335/336/435)
- 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
- Fluid flow to understand landscape erosion
- 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?
- How does the Nevanlinna transformation affect the adjacency matrix of a graph?

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, reasoning, and analytical abilities
- Varied career options, especially with a minor
- Interesting and intellectually challenging
- High demand for K-12 teachers, CSET waiver

Math Major Cons

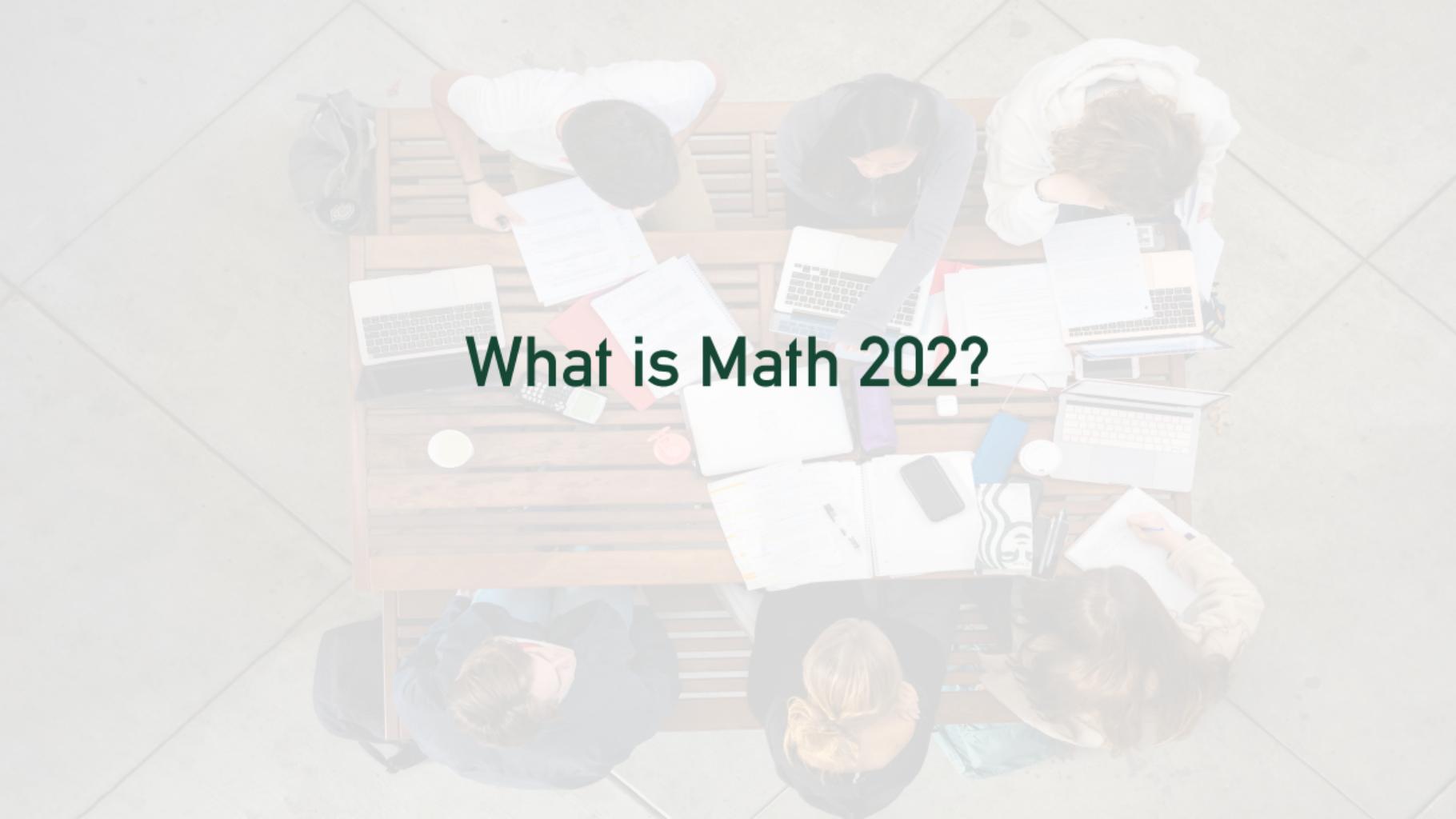
- General purpose major, not trained for anything specific
- Need to sell your abilities to earn entry level positions
- Not what some expect (abstract, proof writing)
- PhD/academic career path is extremely challenging

Cal Poly Math Major Pros

- Wide variety of courses/research opportunities
- Small class sizes/major with large, excellent faculty
- 4 + 1 program/graduate school preparation
- 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, esp. for out of state
- Not many local mathematics 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>