Math 8174
Algebraic Theories
Week 0
Introduction to algebraic theories

Charlotte Aten

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Welcome to Math 8174

I'll go over the course syllabus, which will also be posted on the 8174 webpage.

Today's topics

1. Course goals
2. Universal algebra
3. Category theory

Course goals

- Learn how to view algebraic structures as functors
- Be able to identify algebraic categories by their categorical structure
- Understand the connection between syntax (algebraic theories) and semantics (categories of models)

Universal algebra

- One way to generalize the algebraic structures you've seen in previous courses is to note that they all consist of an underlying set (a *universe*) and a collection of *basic operations* on that set.
- I'll review the basic notions of universal algebra during the first part of the course and we'll cover more advanced topics as they come up.

Category theory

- Another way to generalize the algebraic structures you've seen in previous courses is to note that they all have a notion of *homomorphism* between structures and these homomorphisms obey laws like a monoid under composition.
- I'll review the basic notions of category theory during the first part of the course and we'll cover more advanced topics as they come up.