First Year Seminar Outcomes

- I. A. Recognize, differentiate, and effectively employ appropriate and increasingly sophisticated strategies to collect and interpret information;
- I. B. Successfully integrate disparate concepts and information when interpreting, solving problems, evaluating, creating, and making decisions;
- I. C. Examine and evaluate how their own personal, historical, and cultural perspectives affect the discovery and generation of knowledge;
- II. A. Articulate and comprehend effectively, using verbal or non-verbal communication suitable to topic, purpose, and audience;
- II. B. Use writing effectively to discover and develop ideas and to articulate positions in contexts of increasingly complexity;
- IV. C. Collaborate effectively with others in a shared process of inquiry and problem-solving.

Course Themes

- What is science and mathematics?
- Implications of research
- How and when are we convinced that a theory, experiment or proof is correct
- Diverse perspectives and disciplines

How would you define an equation?

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Adapted from Steve Zides

Aristotle's Thoughts on Equals: *What is really peculiar to quantities is that we compare or contrast them in terms or on grounds of equality. We predicate 'equal', 'unequal' of all of the quantities mentioned. Of nothing, moreover, save quantities can we affirm these two terms. For we never say this disposition is 'equal' to that or 'unequal'.Such things are termed 'like' and 'unlike'*

Comparing Infinite Quantities

A major controversy in mathematics for a long time was whether one could compare infinite quantities.

- Galileo Galilei believed that the sizes of infinite sets could not be compared or contrasted.
- Georg Cantor's revolutionary ideas on the comparison of infinite sets form the basis of many ideas in modern mathematics, including the fields of analysis and calculus. However, Cantor did not receive the recognition during his lifetime that he does today. Some theologians believed his work challenged the uniqueness and infinity of God and both mathematicians and theologians strongly objected to his work at the time.

What is your Favorite Equation?

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2. Write down the equation as best as you can.
3. What is the equation trying to tell you about the world?
4. Why do you think the equation is important?

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5. In a group of three people, share your responses.

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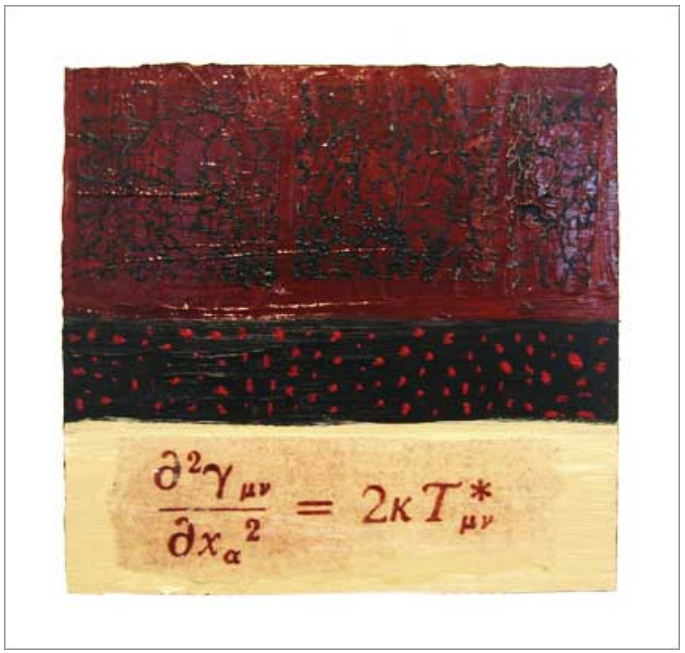
6. Rank the three equations in order of their *truth*.

Empirical versus Platonic Equations

- Empirical equations are based on observation and experience. They are approximate relational fits to experimental data. One can never prove an empirical equation is true.
- Platonic equations are derived from a given set of axioms. Assuming the axioms are true, one can prove a platonic equation is true.



Mary Lesser: Relativity

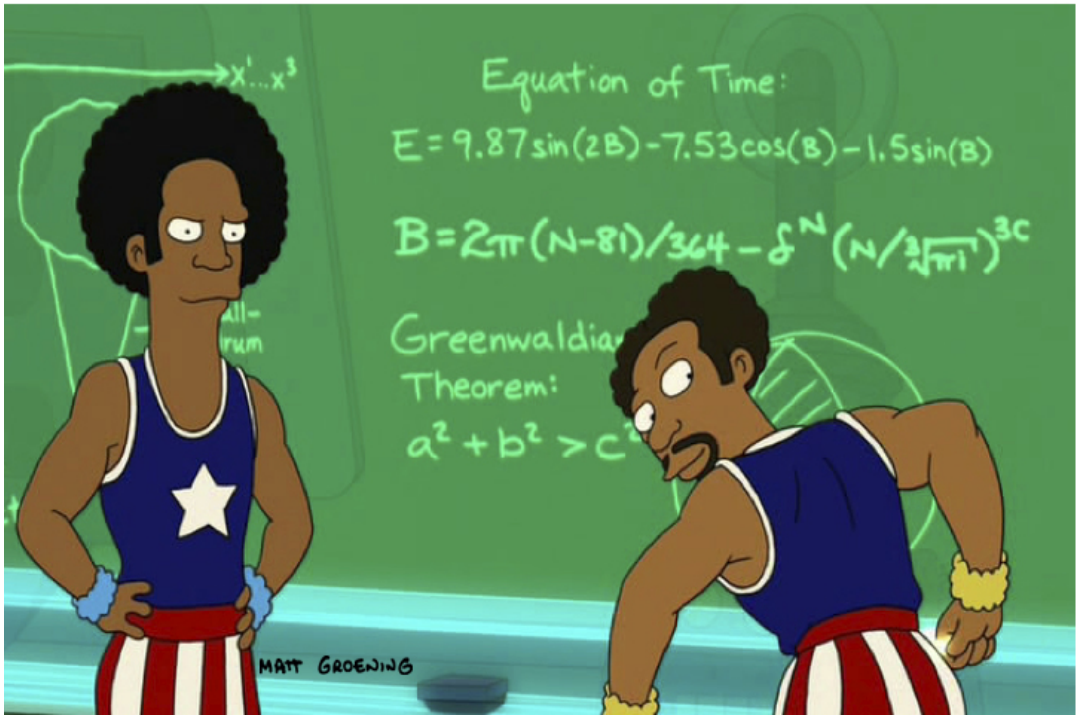
Scene from *Bender's Big Score*

Farnsworth: *So paradox free time travel is possible after all.*

Bubblegum: *Right on. But dig this multiplicand here.*

Farnsworth: *The doom field? That must be what corrects the paradoxes.*

Curly Joe: *When that momma rises exponentially, it could rupture the very fabric of causality.*



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Dennis Deturck: *Despite the fact that great historical and theoretical significance has been imported to fractions and rational numbers, its study should be deferred until it's really needed and can be appreciated, which may not be until after somebody learns calculus.*

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- What are topics that were once taught and are no longer in the curriculum?
- What other areas do fractions impact?