The Art of Equations

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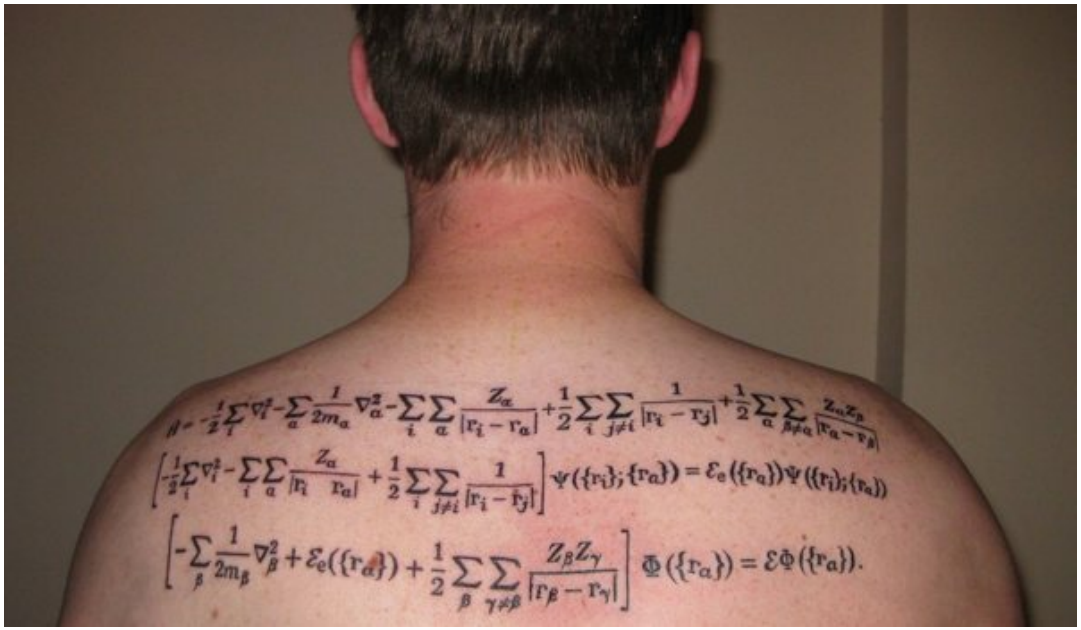
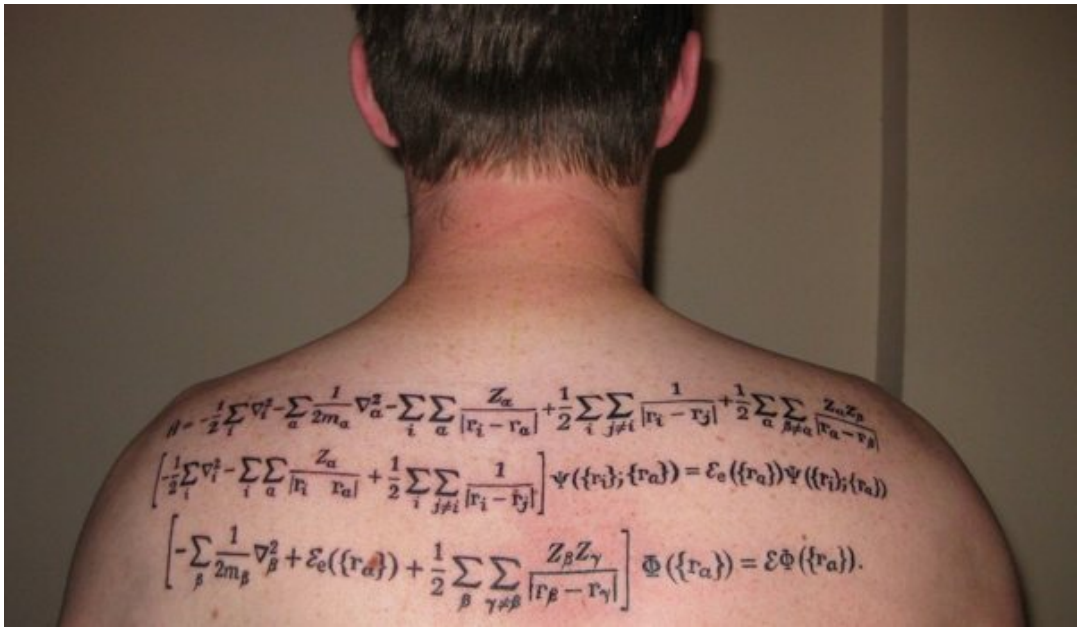
Liz Lerman Dance Exchange: *The Matter of Origins*

How would you define an equation?



How would you define an equation?

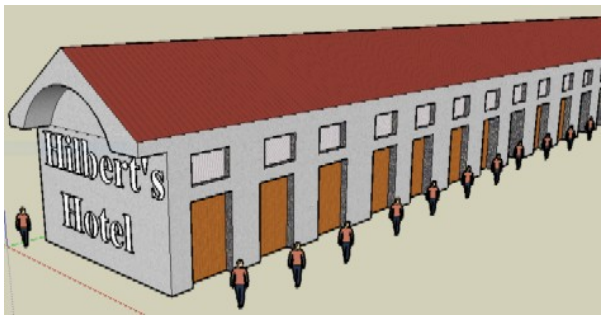


Aristotle's Thoughts on Equals: *What is really peculiar to quantities is that we compare or contrast them in terms or on grounds of equality. We predicate 'equal', 'unequal' of all of the quantities mentioned. Of nothing, moreover, save quantities can we affirm these two terms. For we never say this 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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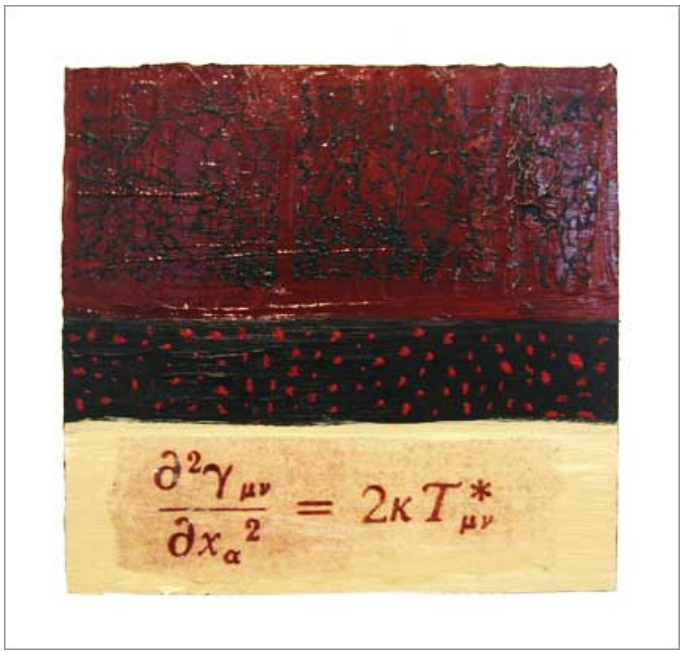
3. In a group of four people, share your responses and rank the equations in order of their *truth*.

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

Down with Fractions

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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.*

 Share aspects of the speech that surprised you or that you agreed or disagreed with.

Beauty in Equations : $e^{i\pi} = -1$

- *It is absolutely paradoxical; we cannot understand it, and we don't know what it means, but we have proved it, and therefore we know it must be the truth.* [Benjamin Peirce, 19th century]

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- *Like a Shakespearean sonnet that captures the very essence of love, or a painting that brings out the beauty of the human form that is far more than just skin deep, Euler's Equation reaches down into the very depths of existence.* [Keith Devlin]