



# Theorem

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A red die with yellow pips is shown on a colorful game board. The board features green circular spaces with numbers like '9' and illustrations of yellow sheep. The background is a soft-focus landscape with green hills and a blue sky.

# The History of "Theorem"

- There was a math duel?!? More people need to know about this!
  - What about a game that lets players take sides to affect the outcome?
    - What about a game that lets time-traveling players take sides by affecting the whole history of math?
      - What math does it take to solve a cubic equation, anyway?
  - The Math:
    - Solving cubic equations builds on knowledge built from solving quadratic equations
      - Quadratic equations can be solved geometrically or algebraically
        - Did you know that symbolic math was invented over centuries, starting in the Golden Age of Islam and moving over to Europe?
          - We're gonna need a bigger board.



# The Game

*Greetings, time-travelers. Welcome to the fifth annual time-tagging competition. This year's goal: determine the winner of the Cubic Equation Math duel in 1547. To compete in the final event, you must earn History points by tagging famous mathematicians and mathematical relics throughout time and space. Manage your resources wisely – there is always less time than you think. Remember, no two time-travelers can be in exactly the same place at the same time. Good luck!*



# Educational Goals



**Teach students that math is a living series of developments, born of insight and hard work, and often hotly contested**

Students will explicitly grapple with the development of specific areas of math and related sciences as they play. Stories of mathematicians, the struggle for immortality built into the game, and the culminating math duel, will each emphasize this lesson.



**Give students a sense of the flow of mathematical reasoning**

Progression in the game is tied directly to 'buying in' to mathematical progression in certain areas. A concept of a postulate leads to a concept of inductive reasoning, deductive reasoning, and theorems, which allow one to demonstrate that certain ideas are TRUE.



**Teach students that history is the result of decisions made, contested, celebrated, hidden, denied, and lost**

# Components

- Civilization game boards: Egyptian, Babylonian, Greek, Roman, Indian, Arabian, and Italian
- Player tokens to track movement and resources
- A History and Eureka points board to track resources that accumulate throughout the game
- Multi-sided innovation cards
- Study cards, featuring numbers and mathematical applications
- Figure and relic cards
- Rules sheet

Play aids are printed on the civilization game boards. Figure, Relic, and Innovation instructions appear on the cards

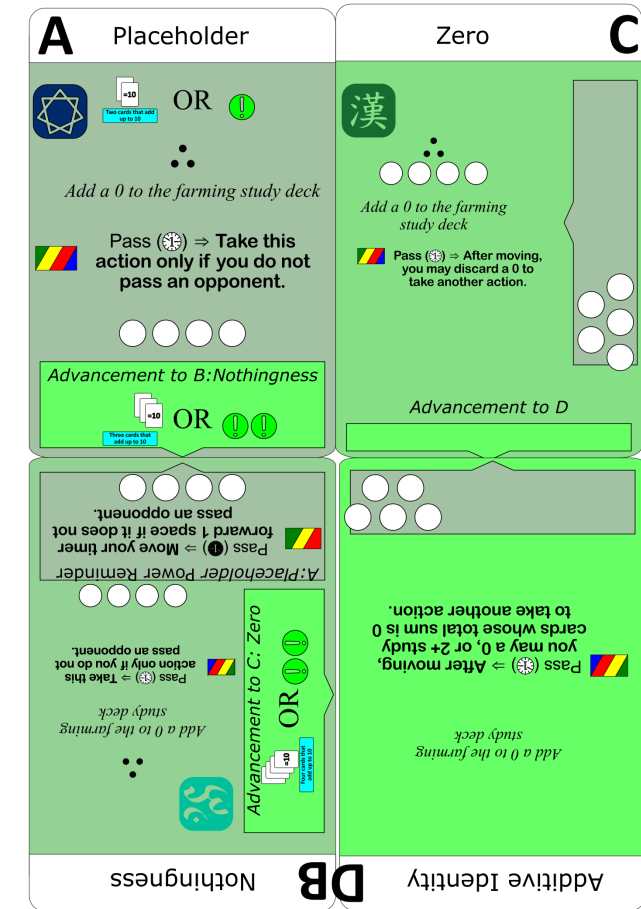
# Game Play

To win, Players need History Points. History points are earned by

- Buying into mathematical innovations, which confer various game-related benefits
- Supporting famous mathematicians, which also yields other game-related benefits
- Earning Politics points, which are directly converted to History points at the end of every era
- Choosing the winner in the final math duel

**Study cards** (playing cards with numbers and math-related achievements), **Wealth**, and **Politics** are the resources used to buy innovations, immortalize mathematicians, and support the player's chosen champion the final math duel

## ZERO TRACK



# Game End and Debrief

The game ends with the math duel involving Nicolo Tartaglia, Gerolamo Cardano, and Lodivico Ferrari, with François Viète also appearing.

Players 'back' their champions by handing their champion specific desired resources (accumulated throughout the game). The champion who is supported the most robustly wins the duel.

In the Debrief, we ask:

- Name one figure or relic you remember
- Was the game fair?
- Were the rules clear?
- Did the flow of innovations on the cards make sense?
- After playing, has your perception of math changed?
- After playing, has your perception of history changed?

Stars and Wishes?

