Vv156 Honors Calculus II

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University of Michigan - Shanghai Jiao Tong University
Joint Institute

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交大密西根学院

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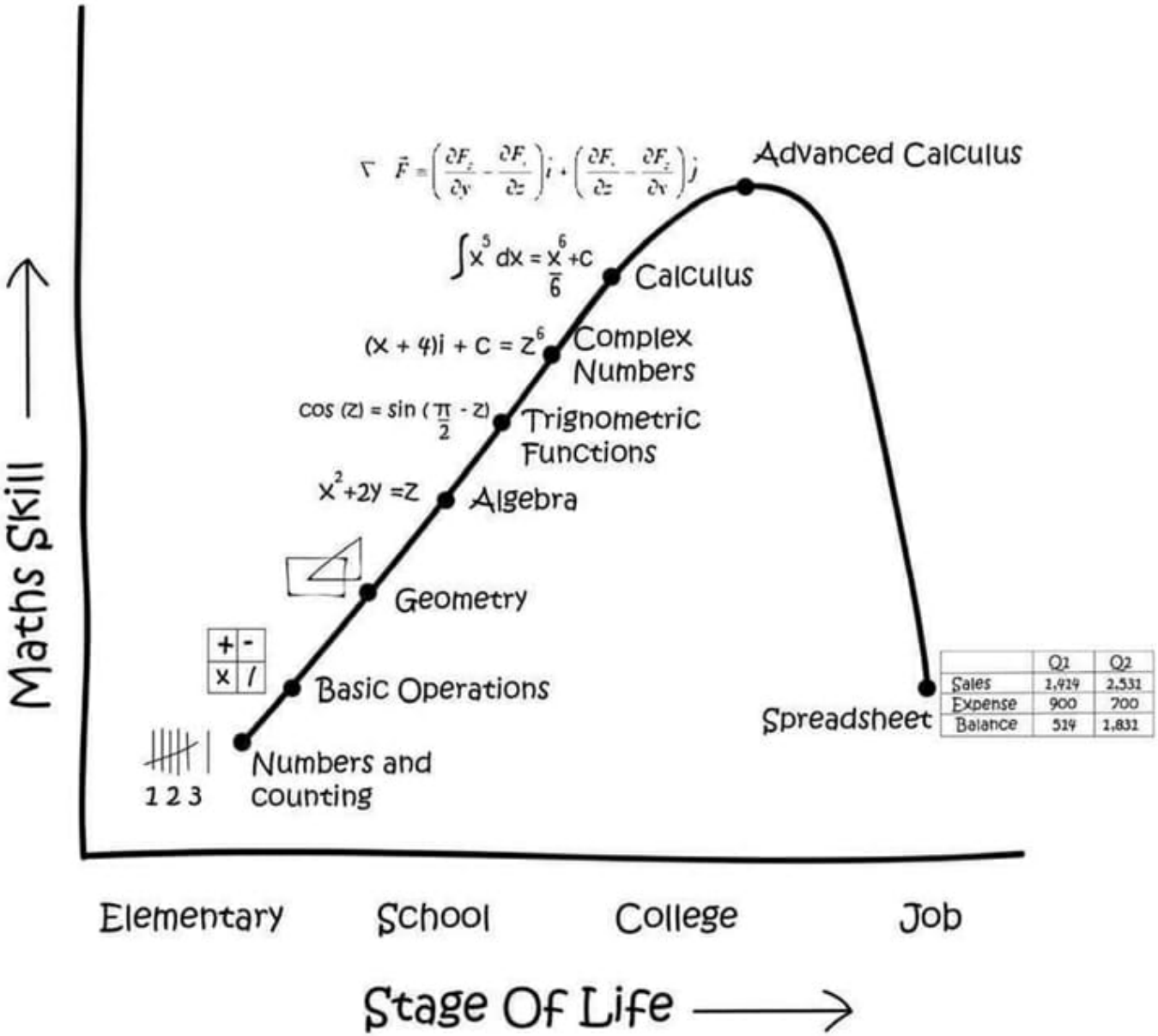
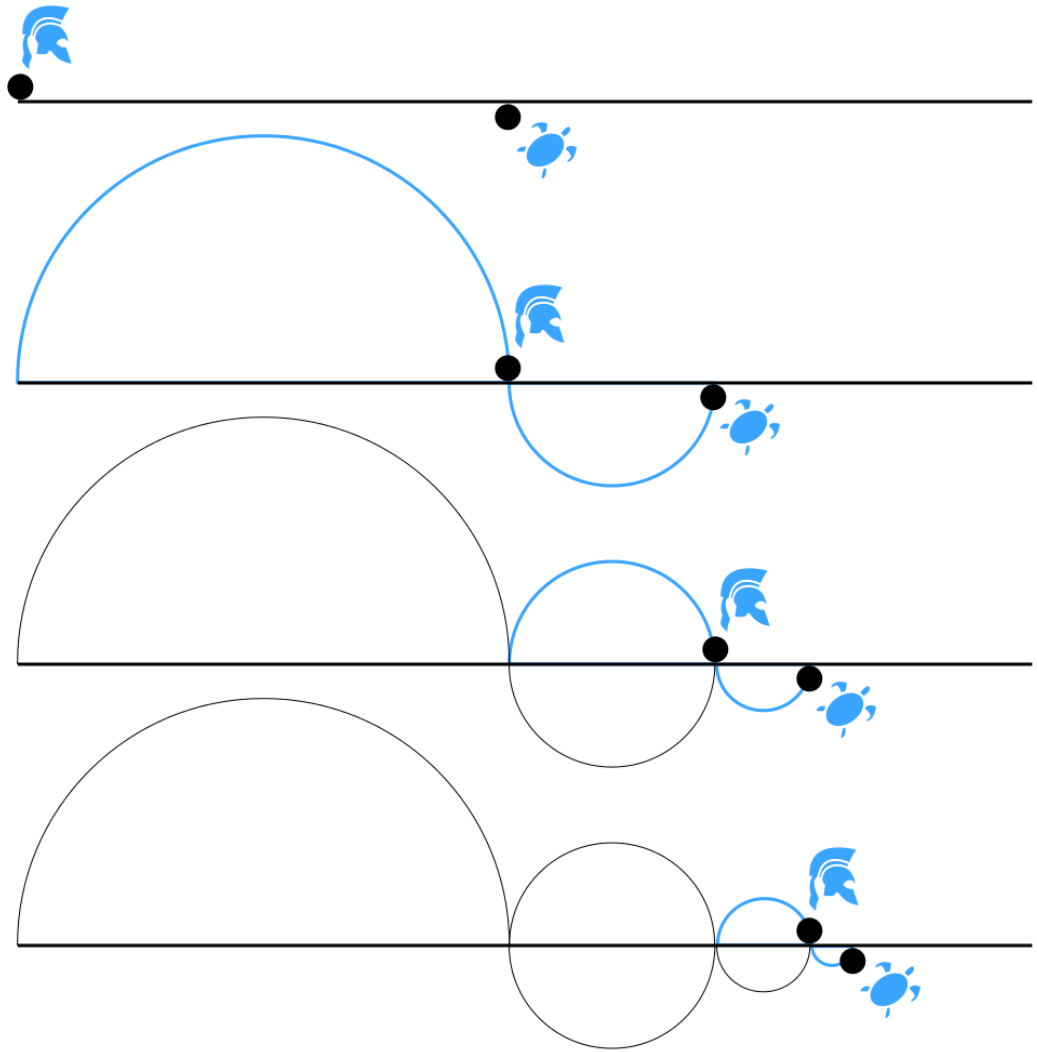
Stage of Life

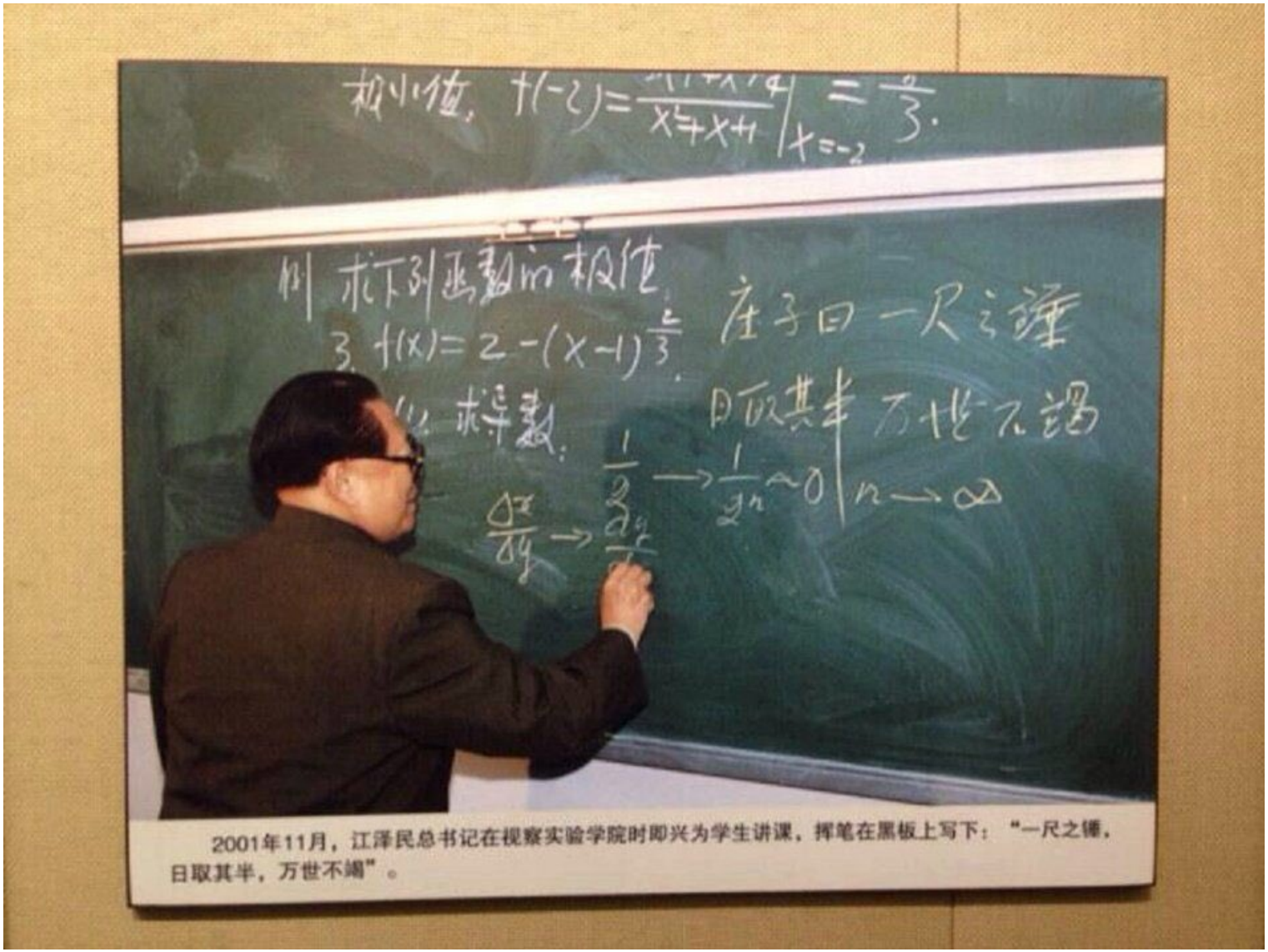


What is Calculus

Zeno's paradox



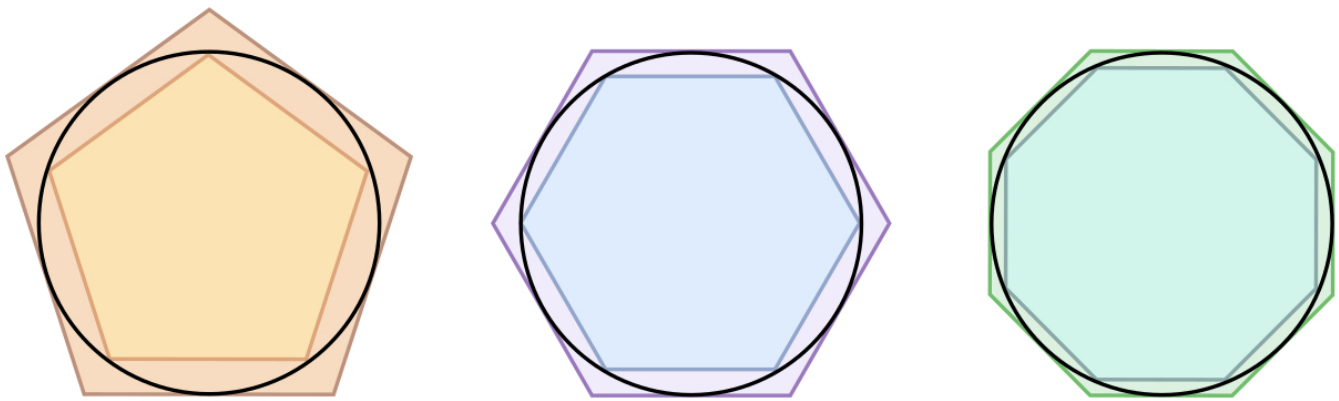
What is Calculus



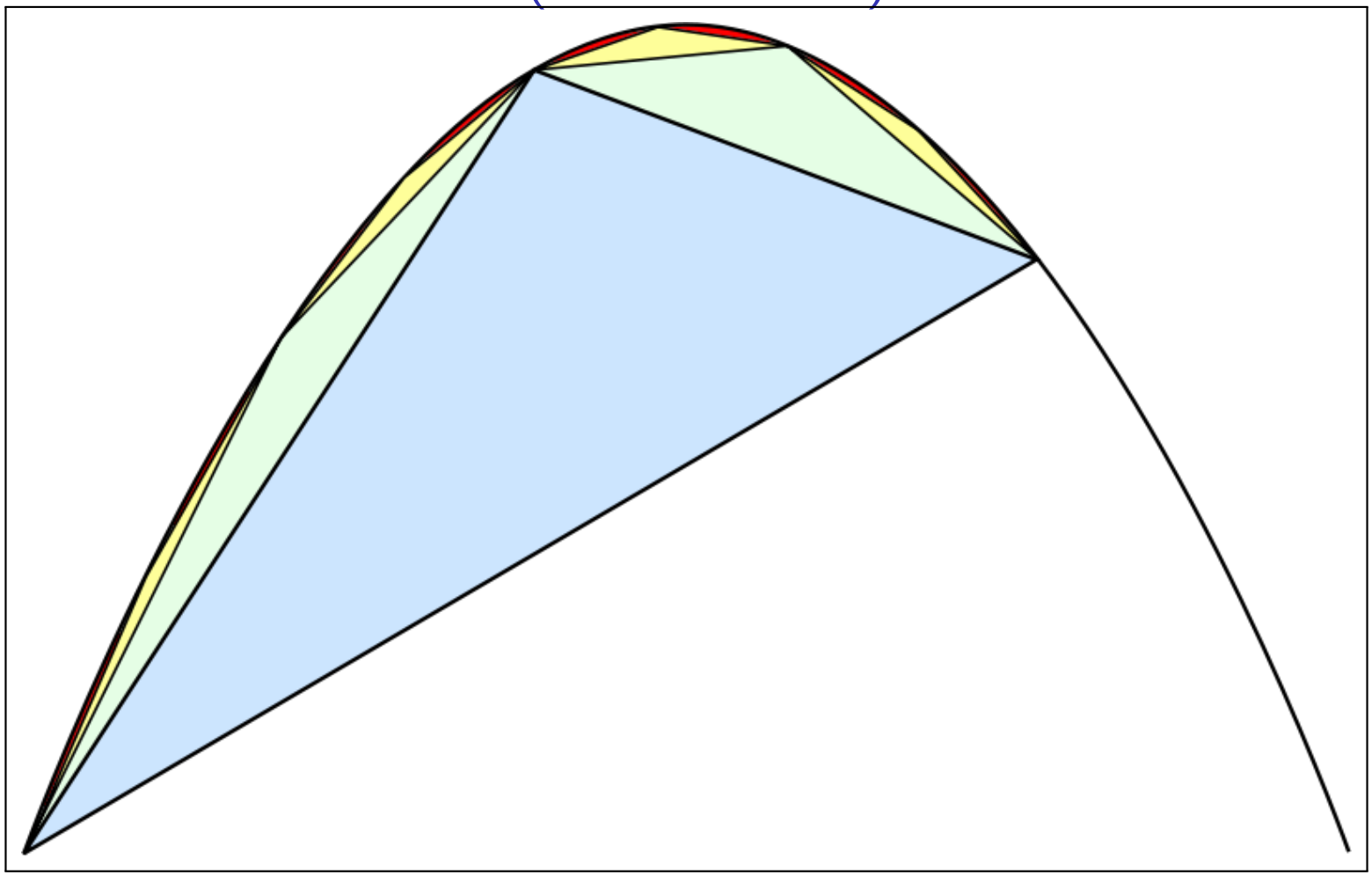
2001年11月，江泽民总书记在视察实验学院时即兴为学生讲课，挥笔在黑板上写下：“一尺之锤，日取其半，万世不竭”。

Pure Mathematics vs Applied Mathematics

- Euclid: Ratio between circumference and diameter is a constant.
- Archimedes: How much is π?



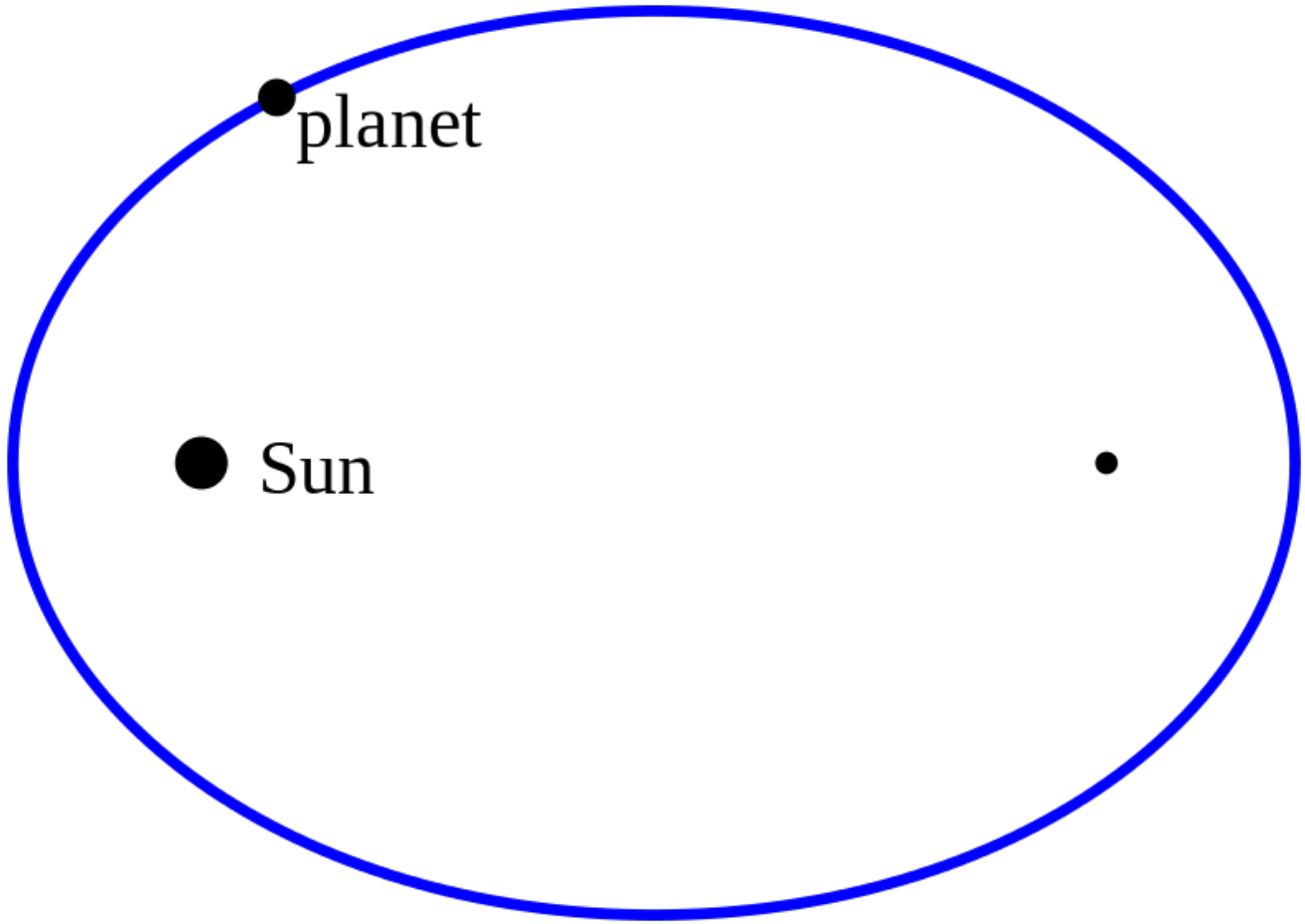
Quadrature of Parabola (Archimedes)



$$\text{Area} = T + 2\left(\frac{T}{8}\right) + 4\left(\frac{T}{8^2}\right) + 8\left(\frac{T}{8^3}\right) + \cdots$$

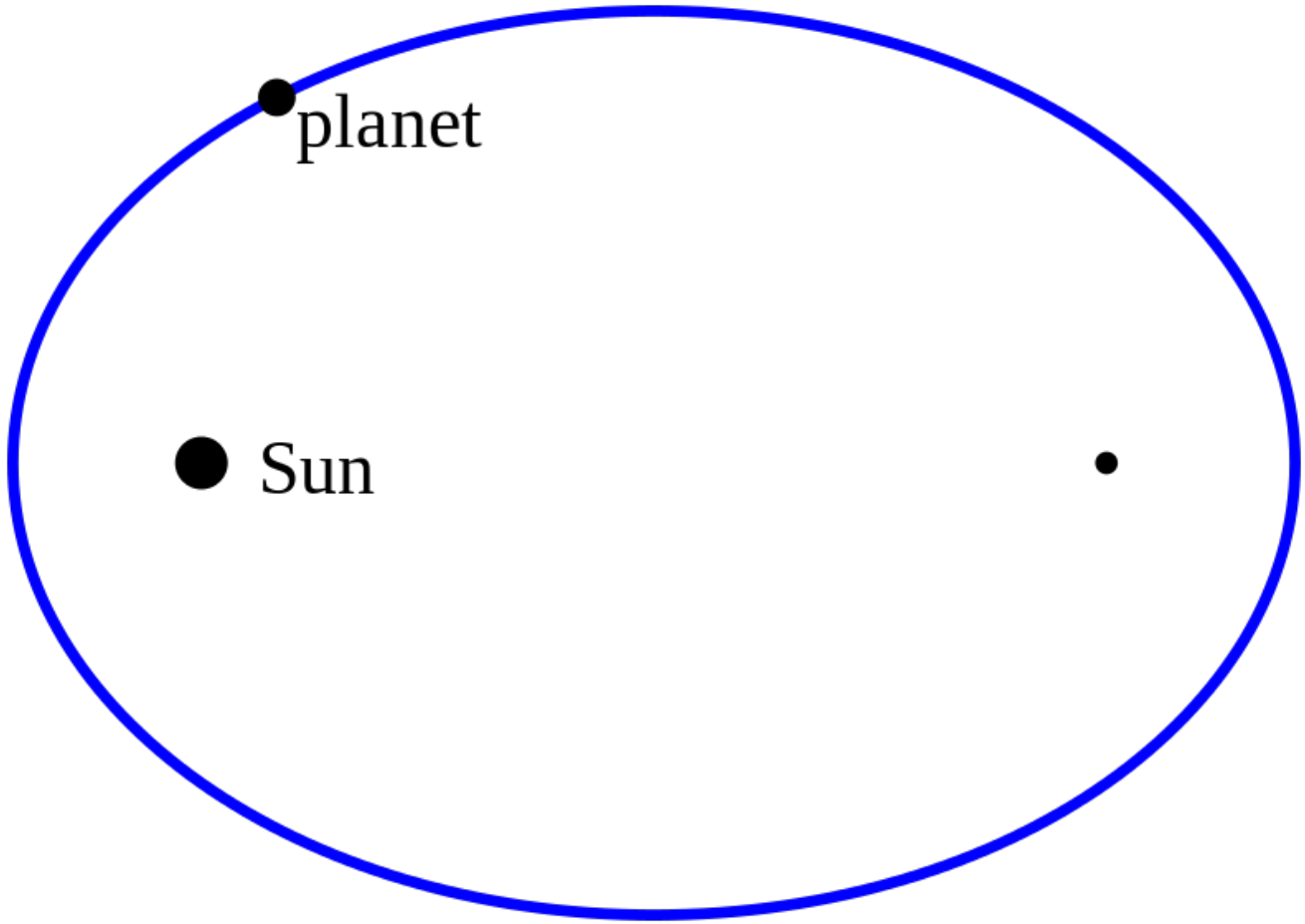
$$= \left(1 + \frac{1}{4} + \frac{1}{16} + \frac{1}{64} + \cdots\right) T = \frac{4}{3} T$$

Kepler's Laws of Planetary Motion $\times 3$



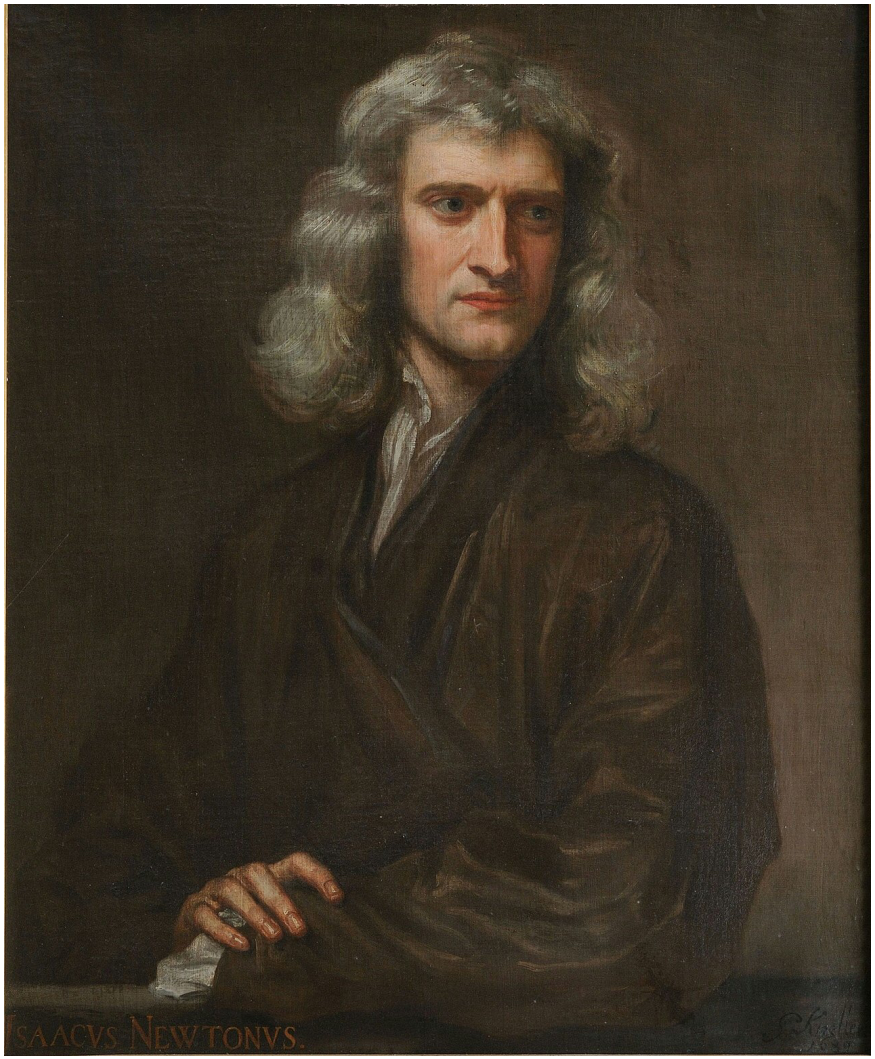
Geometry (static)

Newton's Laws $\times 2$



Differential Equations! (dynamic)

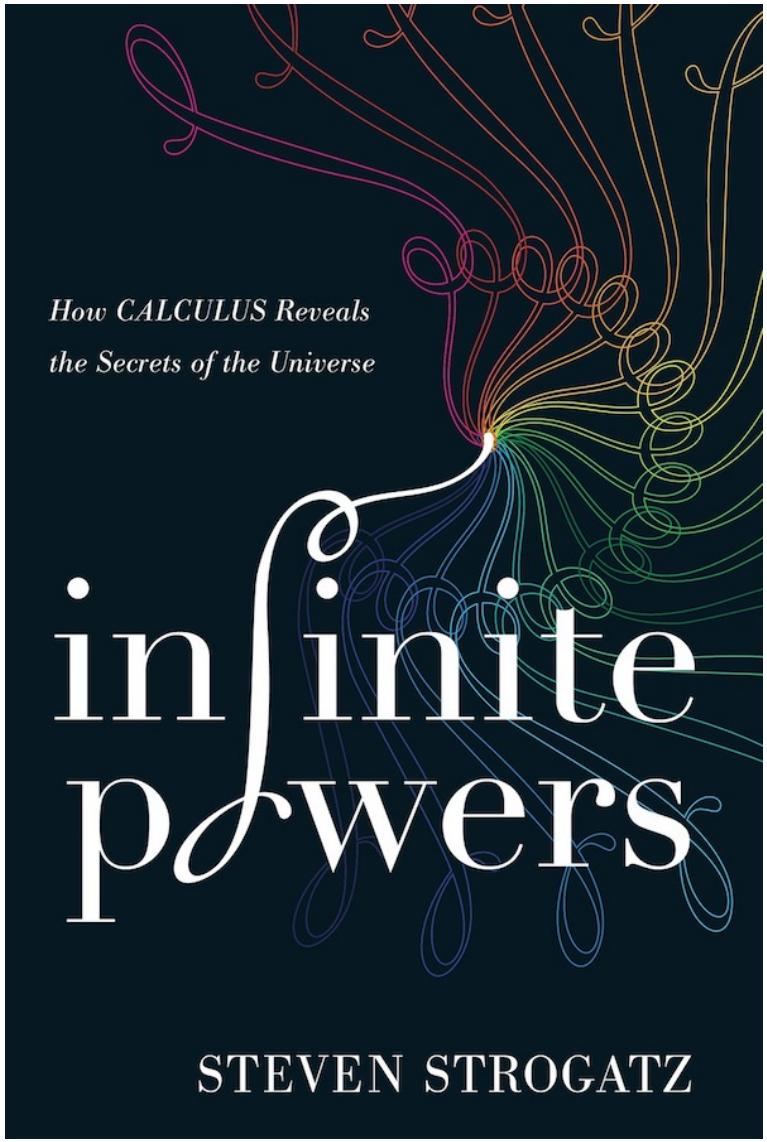
Newton and Leibniz



Isaac Newton, Influential English physicist and mathematician

Gottfried Wilhelm Leibniz, German mathematician and philosopher

Calculus vs Analysis



Steven Strogatz, Professor of Applied Mathematics, Cornell University

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Instructor and Teaching Assistants

Instructor

- Runze Cai, cairunze@sjtu.edu.cn, 441B Longbin BLD

Instructor Office Hours

- 14:00 – 15:00, Mondays, or by appointment.

Teaching Assistants

- Yilin Zhang, yilinsjtu@sjtu.edu.cn
- Yucheng Huang, hyc391@sjtu.edu.cn

TA Office Hours

See Canvas

Lectures and Recitation Classes

Lectures

- 8:00 – 9:40, Mondays (odd weeks only), D112
- 8:00 – 9:40, Tuesdays, D112
- 8:00 – 9:40, Thursdays, D202

Recitation Classes

See Canvas

Literature

- James Stewart, Calculus, 7ed

Coursework (courtesy of Prof. Hohberger)

- (Roughly) weekly coursework (assignments) throughout the term.
- You will be randomly assigned into ***assignment groups*** of three students; you are expected to collaborate within each group and hand in a single, common solution paper to each coursework.
- Each student must achieve 60% of the total coursework points by the end of the term in order to obtain a passing grade for the course. However, the assignment points have no effect on the course grade.
- Each member of an assignment group will receive the same number of points for each submission. However, there will be an opportunity for team members to anonymously evaluate each others' contributions to the assignments. In cases where one or more group members consistently do not contribute a commensurate share of the work, a TA will investigate the situation and individual group members may lose some or all of their marks.

Coursework

- Please hand in your coursework on time, by the date given on each set of course work. Late work will not be accepted unless you come to me personally and I find your explanation for the lateness acceptable.
- You can be deducted up to 10% of the awarded marks for an assignment if you fail to write neatly and legibly.
- You are encouraged to compose your coursework solutions in LaTeX. While this is optional, there will be a 10% bonus to the awarded marks for those assignment handed in as typed LaTeX manuscripts.

  LaTeX is open-source software for mathematical typesetting, and there are various implementations available. I suggest that you use Baidu or Google to find a suitable implementation for your computer and OS. LaTeX is widely used for writing theses and scientific papers, so it may be quite useful for you to learn it.
- Further details can be found in the course description.

Use of Wikipedia and Other Sources; Honor Code Policy

- The correct way of using outside sources is to understand the contents of your source and then to write in your own words and without referring back to the source the solution of the problem. Your solution should differ in style significantly from the published solution. If you are not sure whether you are incorporating too much material from your source in your solutions, then you must cite the source that you used.
- You may and are required to collaborate freely with other students in your assignment group. However, you may not communicate at all about concrete coursework with students from other groups. However, discussing general questions regarding the lecture contents with any other student is of course fine and encouraged.

  Do not show or explain your solutions to any student outside your assignment group.

Use of Wikipedia and Other Sources; Honor Code Policy

In this course, the following actions are examples of violations of the Honor Code ("another student" means a student outside your assignment group):

- Showing another student your written solution to a problem.
- Sending a screenshot of your solution via Wechat, QQ, email or other means to another student.
- Showing another student the written solution of a third student; distributing some student's solution to other students.
- Viewing another student's written solution.
- Copying your solution in electronic form (LaTeX source, PDF, JPG image etc.) to the computer hardware (flash drive, hard disk etc.) of another student. Having another student's solution in electronic form on your computer hardware.

If you have any questions regarding the application of the Honor Code, please contact me or any of the TAs.

Grading Policy

- The grade will be composed of the course work and the exams as follows:
  - First midterm exam: 30 points
  - Second midterm exam: 30 points
  - Final exam: 30 points
  - Miscellaneous: 10 points
    - Joining Piazza: 1 point
    - Course Outcome Quizzes: 9 points
- The actual grading scale will usually be based on the top approximately 6–12% of students receiving a grade of A+, with the following grades determined by (mostly) fixed point increments.
- Apart from this normalization, the grade distribution is up to you! If (for example) all students obtain many points in the exams, I am happy to see everyone receive a grade of A. Students are primarily evaluated with respect to a fixed point scale, not with respect to each other.

Class Attendance and Absence for Medical Reasons

I do not formally require that you attend every class. However, if you are unable to attend a significant number of lecture, you should notify me. The following rules have been laid down by the Academic Office:

- A student who has been absent from studies for more than one week because of illness or other emergency should consult the program advisor. **[and also talk to me!]**
- Absence for illness should be supported by a hospital/doctor's certificate. A note that a student visited a medical facility is not sufficient excuse for missing an assignment or an exam. The note must specifically indicate that the student was incapable of completing an assignment or taking the exam due to medical problems.

Class Attendance and Absence for Medical Reasons

- **Late** medical excuses must satisfy the following criteria to be valid:
  i. The problem must be confirmed by the doctor to be so severe that the student could not participate in the exam.
  ii. The problem must have occurred so suddenly that it was impractical to contact me in advance.
  iii. The student must be in contact with me immediately after the exam with the required documentation.