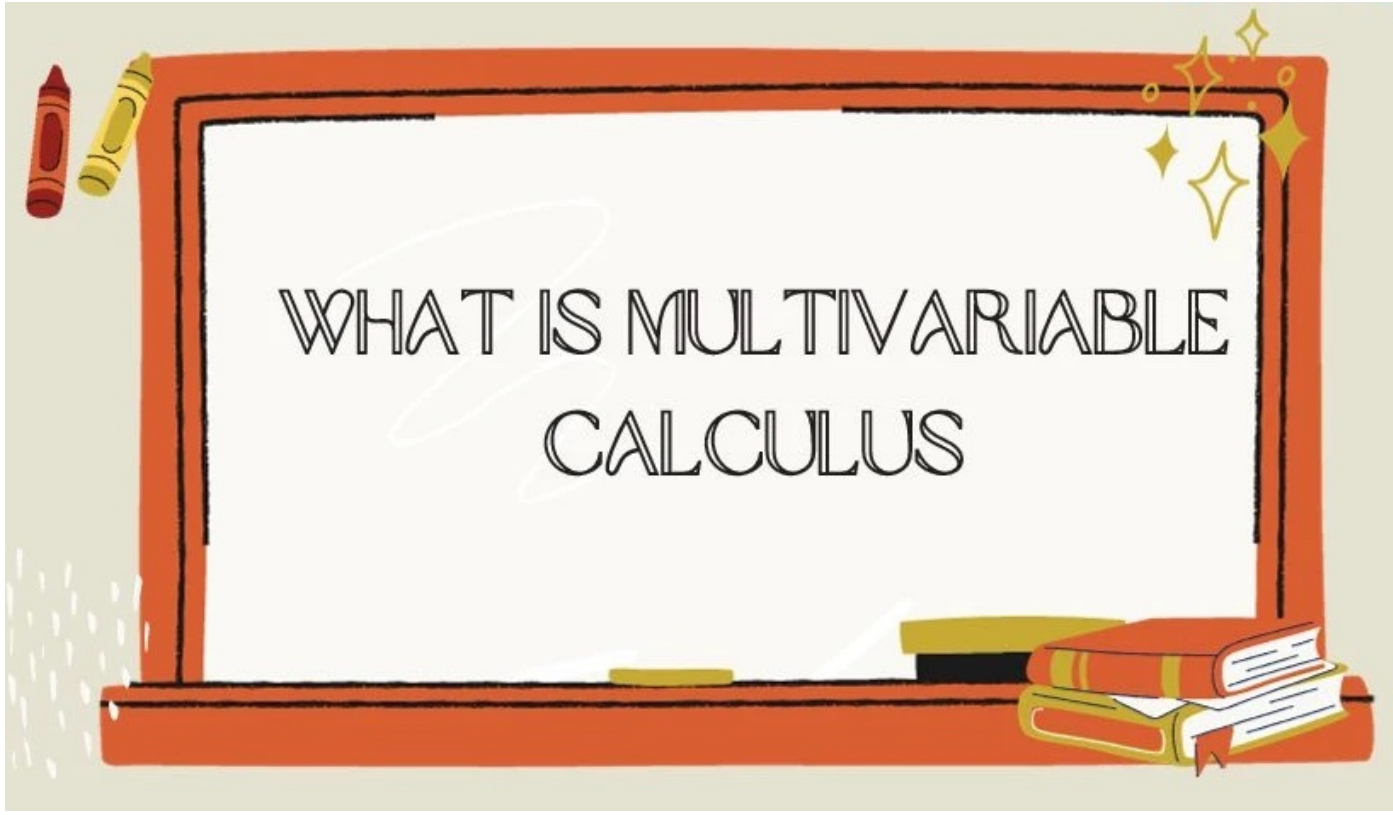
MATH 223: Multivariable Calculus



Class 36: December 11, 2023

Notes on Assignment 34

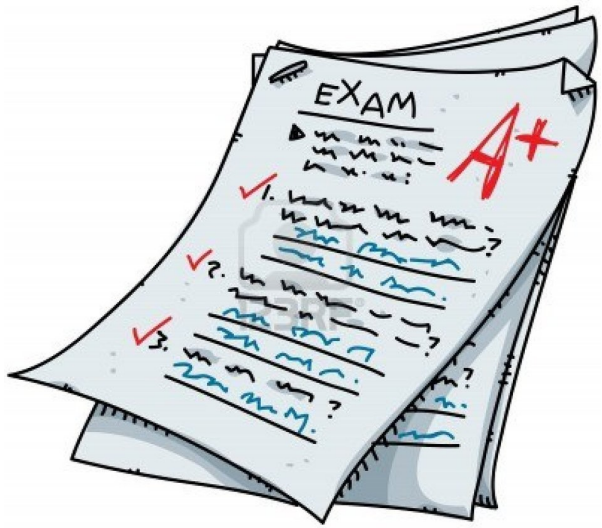
Announcements

- **Course Response Forms Today**
  - Link: https://go.middlebury.edu/crf or **go/crf**
  - Available During Class Time Today
- **Final Examination**

  One Sheet of Notes

Today: 11:00 AM – 1 PM
Wednesday: 10:00 to Noon

Final Exam



Wednesday: 7 PM – 10 PM in Warner 10

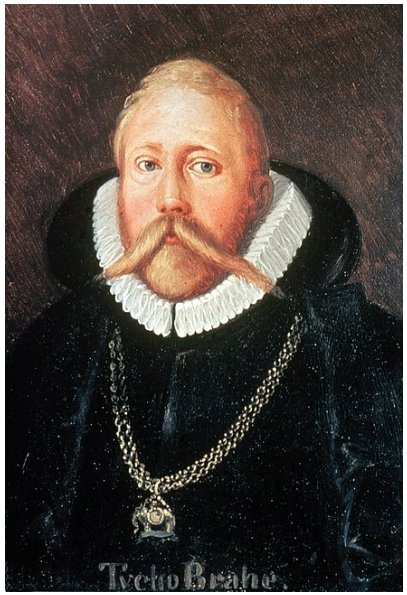
Thursday: 9 AM – Noon in Warner 11

What We Might Do If We Had A Few More Days

- Vector Field Theory Applications
  - Physics, Chemistry, Biology, Oceanography, Meteorology, . . .
  - Stokes' Theorem, Data, and the Polar Ice Caps
  - Economics
- Generalizations To Higher Dimensions and Manifolds
  - Wedge Products, Tensors, Differential Forms
  - James Munkres, *Analysis on Manifolds*
- Newton's Derivation of Kepler's Laws (See Section 2.6.2 of text)

Kepler's Laws of Planetary Motion

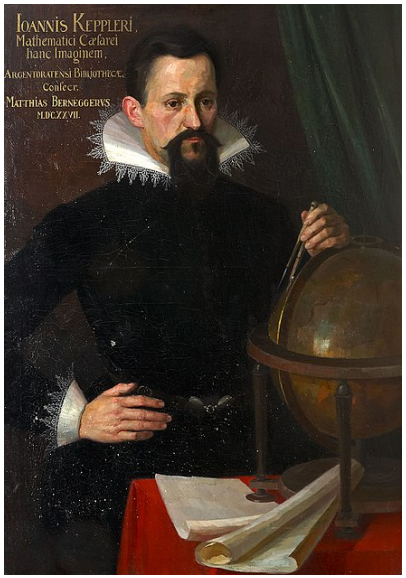
Tycho Brahe



December 14, 1546 – October 24,1601

Biography

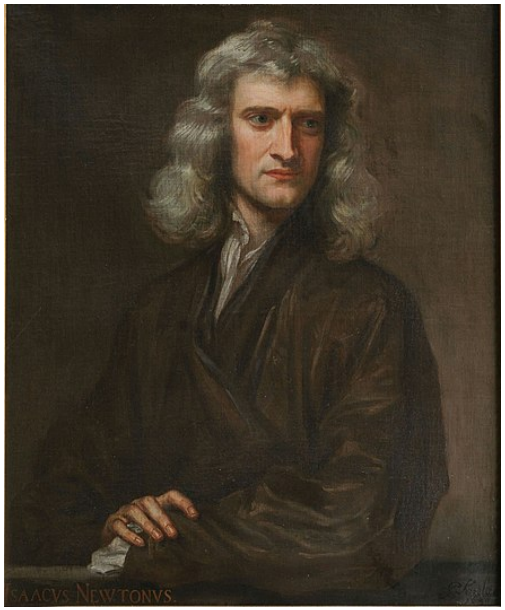
Johannes Kepler



December 27,1571 – November 15, 1630

Biography

Isaac Newton



December 25, 1642 – March 20, 1726

Biography

Kepler's Laws of Planetary Motion

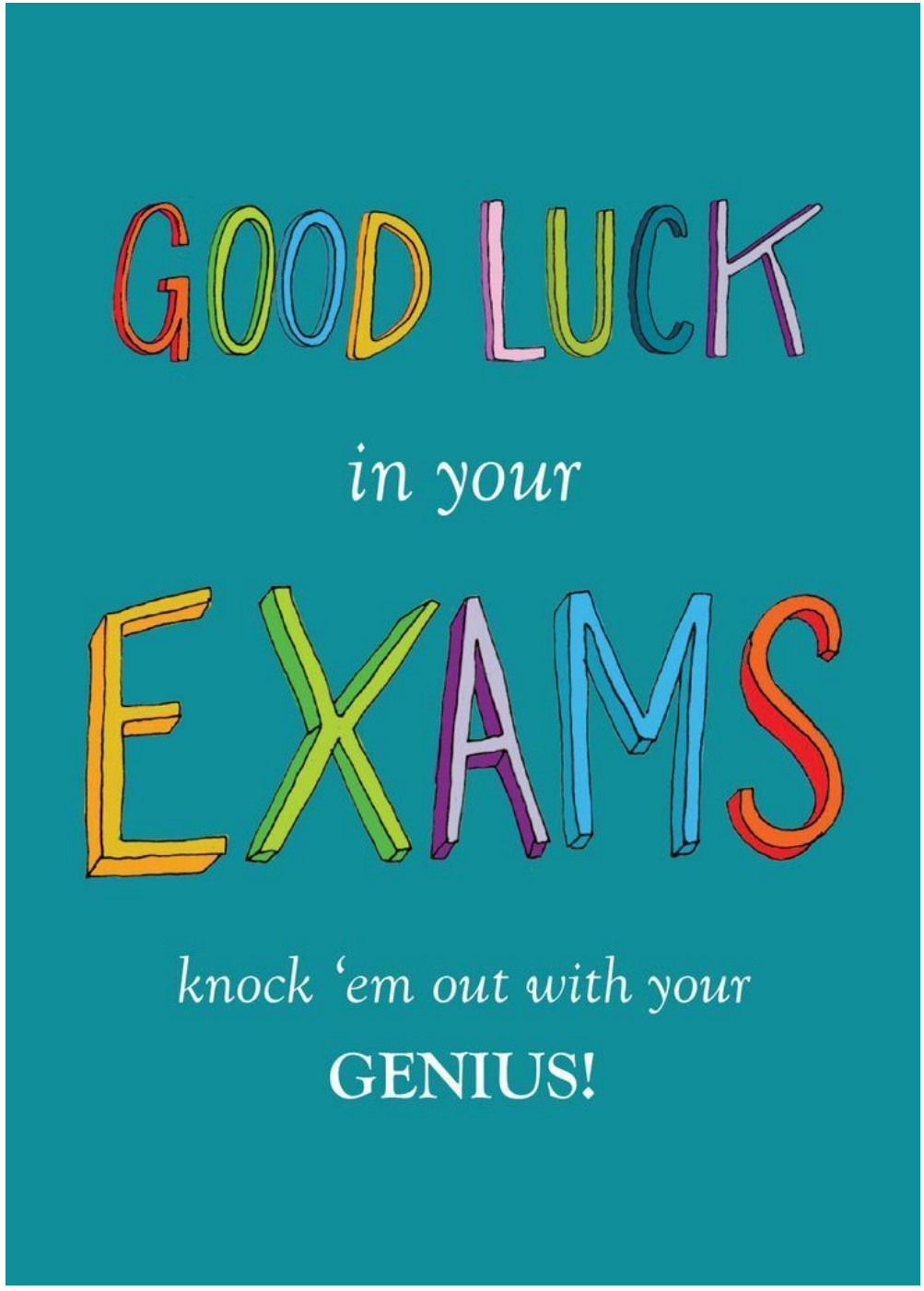
A Planet's Orbit Lieth in a Plane

A Planet's Orbit is an Ellipse with ye Sun at One Focus

The Vector Between ye Sun and ye Planet Sweepeth Out Equal Area in Equal Time

The Square Of Ye Time It Taketh ye Planet To Complete Its Orbit is Proportional to ye Cube of ye Semimajor Axis of ye Ellipse

Reference: Section 2.6 of Our Text


GOOD LUCK
in your
EXAMS
knock 'em out with your
GENIUS!

We hope everyone
has a wonderful
holiday
season and a happy
new year!

THANK
YOU

Course Response Forms

Link: https://go.middlebury.edu/crf/
or **go/crf**