Analysis for Teachers with Maple

Wm C Bauldry

Appalachian State University

ICTCM 19
February, 2007

Outline

Introduction

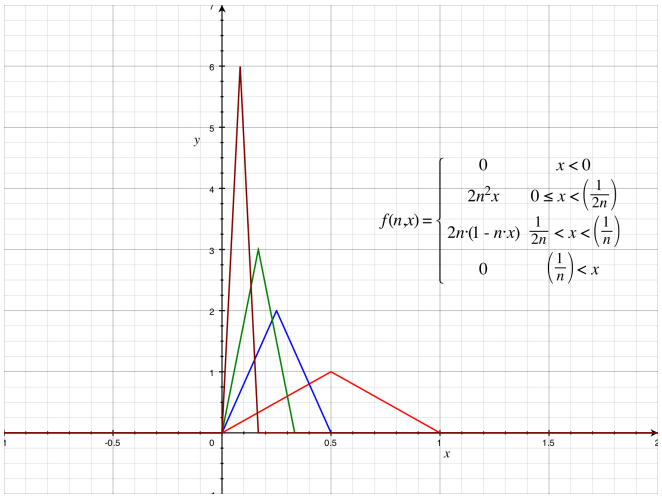
- Objective of the course
  - Enhance mathematics teacher content knowledge
    - Many undergraduate programs do not require analysis/advanced calculus
    - More students take calculus in high school, than in post-secondary schools
- Place in the curriculum
  - Required course in Masters in Math., Secondary Ed., or MAT programs
  - Prerequisite: BS in Math Ed or Math plus teaching experience
- Offering
  - Four or five week summer session. (5 days per week; 2 hours, 40 minutes per day.)

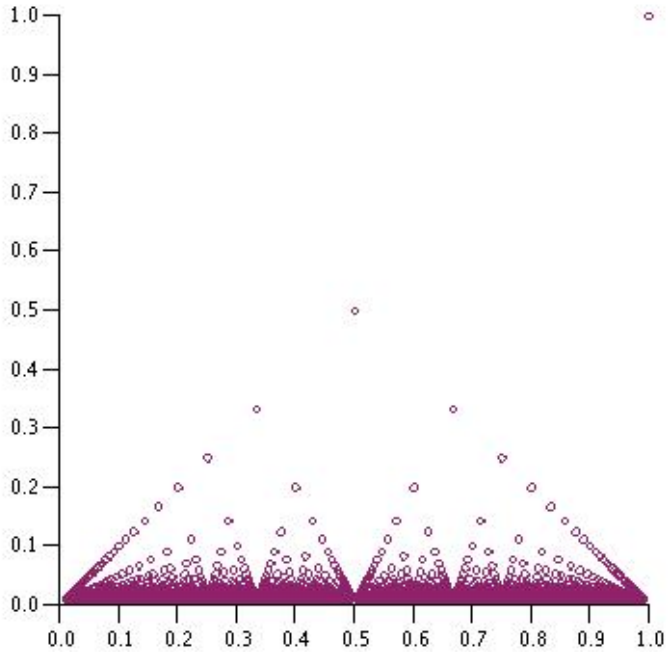
Course Design: Problem Based

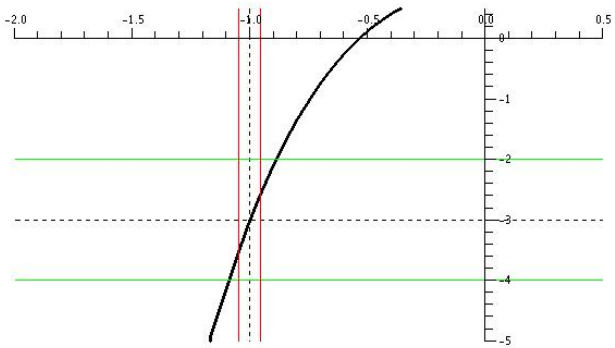
1. Syllabus (four week)
   - Week 1 Review of Calculus, Outline of a Calculus Course, Links to AP Calculus
   - Week 2 Analysis Problems (3 to 4 per day)
   - Week 3 Analysis Problems
   - Week 4 Readings, History, Special Topics (proofs, topology, &c), Presentations, Final Report
2. Individual Project: Write a paper on a historical analysis topic; make a presentation to the class
3. Class Projects:
   - Make an "Analysis Concept Map"
   - Build a glossary of analysis terms
   - Develop an annotated analysis bibliography
4. Assessment

Calculus

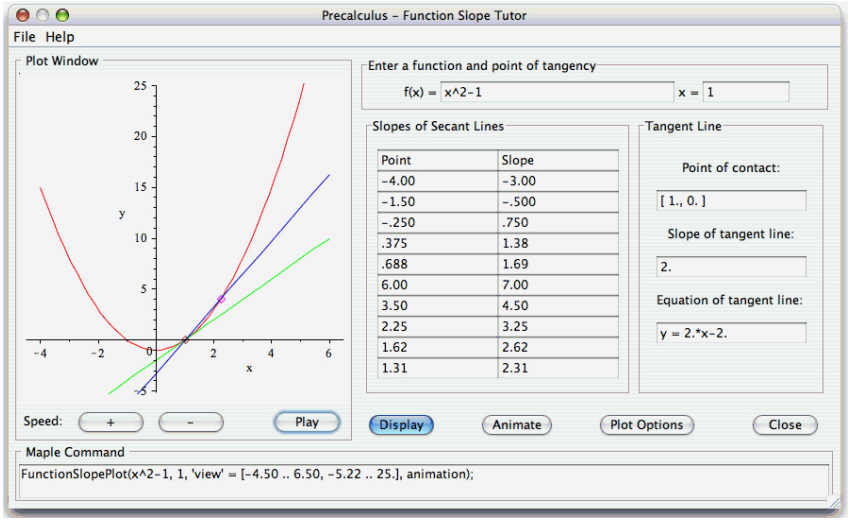
1. Graphs
2. Limits with ϵ-δ
3. Derivatives with difference quotients
4. Integrals via definition
5. Sequences & Series

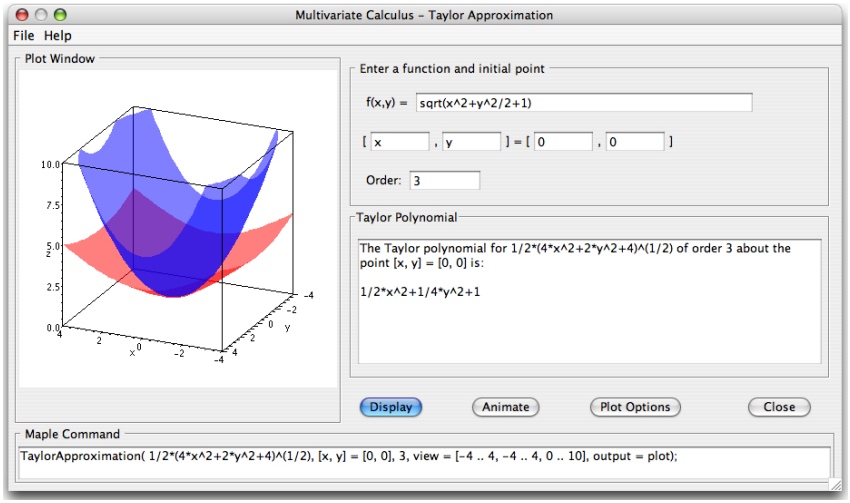


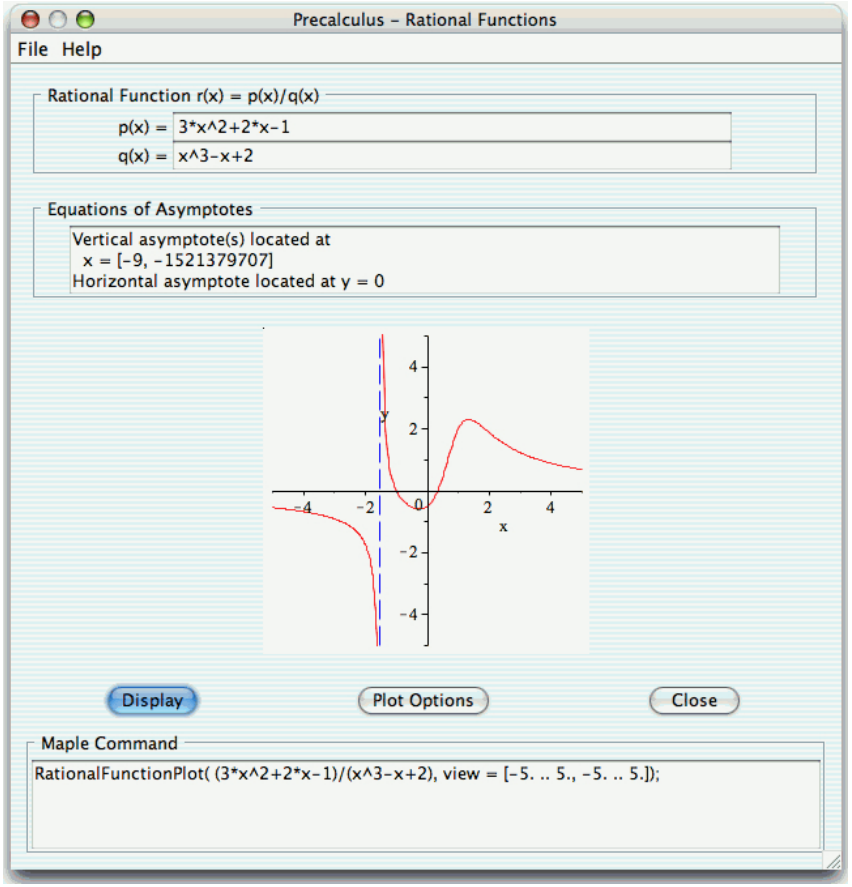




Maple in the Course: Tutors



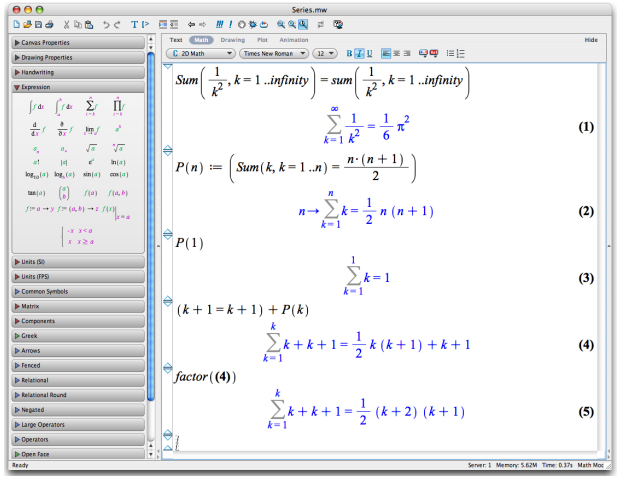


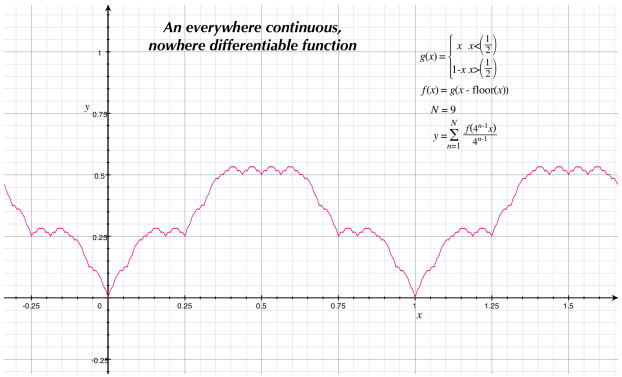


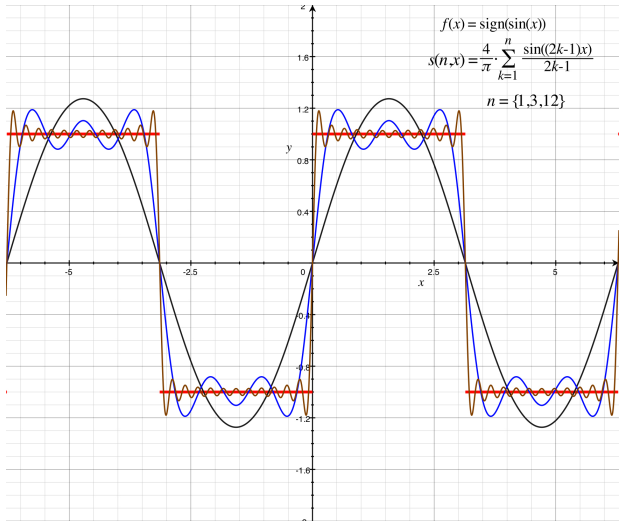
Maple in the Course: Analysis

Analysis

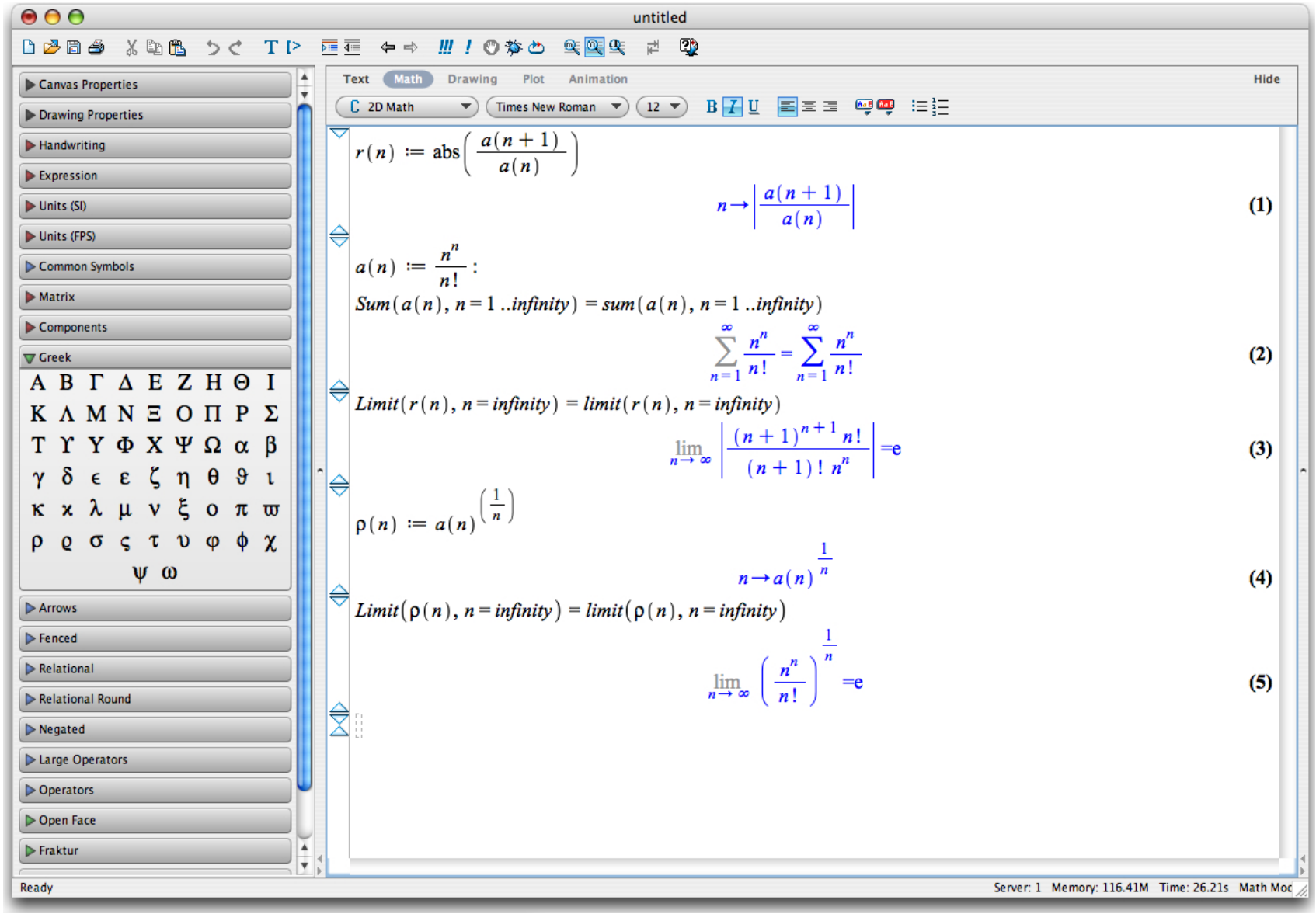
1. Sequences and series
2. Counter examples
3. Continuity and uniform continuity
4. Sequence and series of functions
5. Special functions



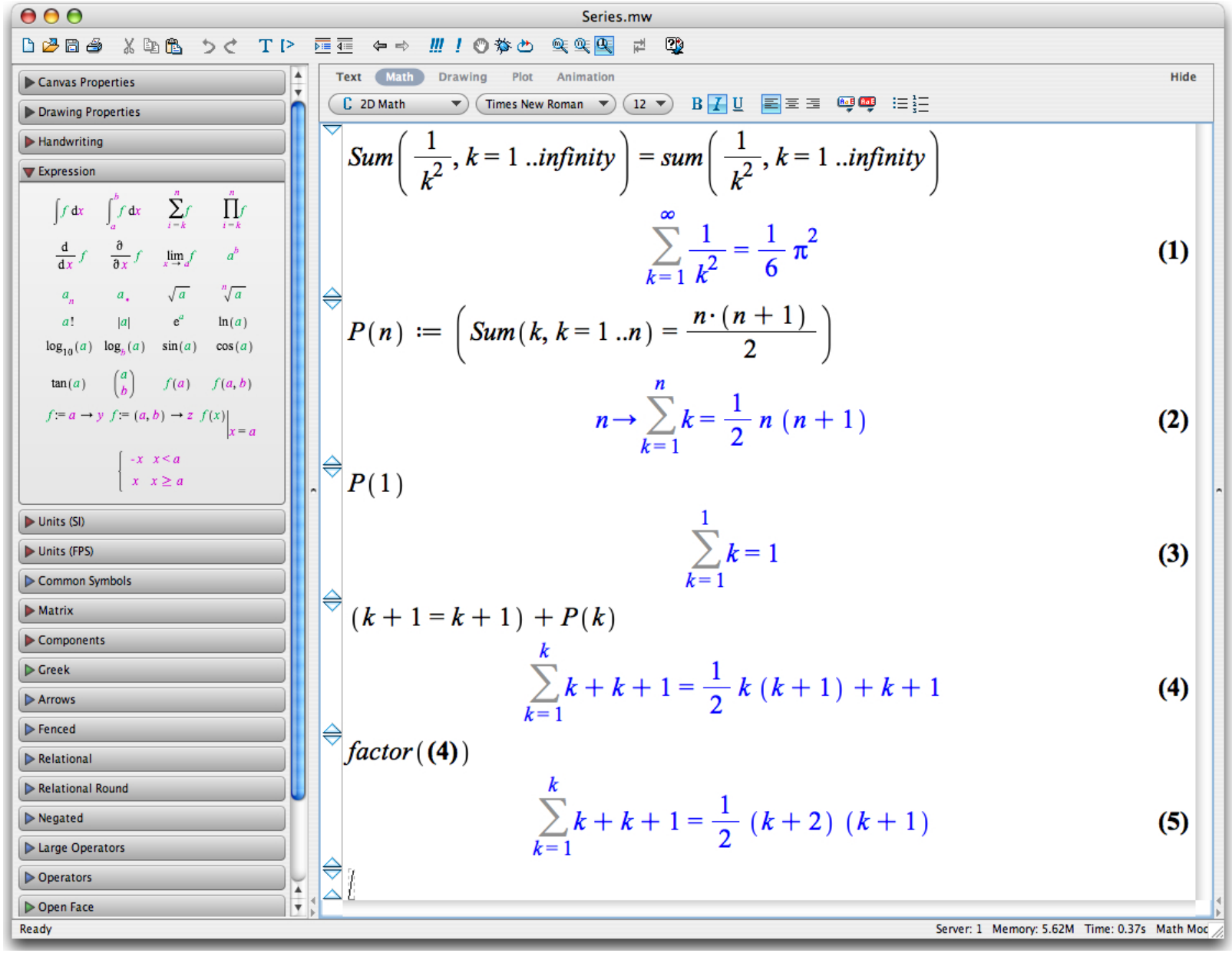




Maple in the Course: Ratio & Root Tests



Maple in the Course: Series and Induction



Questions? *Comments*?

Thank you.

Materials available at

Slides: http://www.mathsci.appstate.edu/∼wmcb/ICTCM19/
A course link:
http://www.mathsci.appstate.edu/∼wmcb/Class/archive.html