Calculus 2 — Outline for Exam 3

Main ideas

A. Sequences

B. Series and tests for convergence

Skills you should have

1. Know the difference between a sequence and a series

- Remember that the terms of a *series* might go to zero, even though the series diverges. Do you remember an example of this?

2. Be able to determine if a *sequence* converges or diverges

- We often treat the sequence as a continuous function and use techniques from before like studying dominant terms, L'Hôpital's Rule, or the squeeze theorem. Make sure to justify your steps.

3. Know and be able to work with the *definition* of a series as a limit of partial sums

- Be able to analyze a series by looking the partial sums. This can be complicated—you would only be asked to do this if the partial sums have a nice form.

4. Be able to recognize a geometric series and find what it converges to or show it diverges

5. Know the meaning of absolute convergence, conditional convergence, and divergence for series

6. Be able to determine if a series converges absolutely, converges conditionally, or diverges

- If you notice the terms don't go to zero, start with the divergence test.
- We usually test for absolute convergence first—good tests to start with are the ratio test or the comparison tests
- If a series does not converge absolutely and has an alternating sign, try the alternating series test.

7. Be able to able to find all values of x for which a series converges (if the series contains the variable x)

- We did a few examples in class. For more practice, look at the new material on power series.

How to study

I. Review core topics

II. Work/rework problems all of the way through—focus on WeBWorK problems and Discussion questions

III. Talk with me if you have any questions at all!

Information for the exam

Due date. This take-home exam is due at **11:59**PM on **Monday, November 23**.

Rules for the exam.

1. You are allowed to use:
   - A calculator/Desmos/Geogebra for *basic* computations and *basic* graphing, but **not** for derivatives or integrals.
   - Either of our books: *Calculus: Early Transcendentals, Eighth Edition* by J. Stewart or *Active Calculus* by M. Boelkins et al.
   - Your notes or my notes that I posted in Canvas.
   - Me as a resource: you can email me at anytime if you have any questions at all.
2. You are **not** allowed any resources on this exam except those listed above.
3. You are **not** allowed to discuss the exam—in any way—with anyone (or any website) other than Josh Wiscons. This includes no Chegg or anything similar.
4. You are **not** allowed to look at another person's exam or their work, and you are **not** allowed to let another person see your exam or your work.
5. Please fully justify your work.
6. If you have any questions about theses rules, please email me as soon as possible.

Any violation of the rules will be regarded as cheating and reported to the Sacramento State Office of Student Conduct.

Recommendations. I recommend setting aside **1.5 continuous, uninterrupted hours** to devote to the exam. But you can take as long as you want until it's due. Please email me if you have any questions!