As you know, you have an exam coming up on the 5th of March. The exam will be held in

Science Center B, 7-9 pm   not SC C as is on the syllabus

This exam will be on series - Chapter 8 of the text (not including 8.10). You will have two hours to do the exam. There will be no calculators or other aids - just you and your trusty pencil.

Here is a non-exhaustive checklist of things we expect you to know:

- What does it mean for a series to converge? To diverge?
- Geometric Series:

  What is a geometric series?

  How can you compute partial sums?

  When does a geometric series converge? Diverge?

- Methods to apply to try to determine convergence/divergence:

  nth term test for divergence (a test for *divergence* only)

  the comparison text for convergence / divergence

  You'll need to know about $p-$series (in addition to geometric series) because both $p-$series and geometric series are good series to have at your disposal for comparison)

  the integral test for convergence / divergence

  the ratio test for convergence / divergence

  the alternating series test for convergence (a test for *convergence* only) and error estimate when the series satisfies all three conditions of the alternating series test.

- Power Series:

  We'll expect you to know what a power series is and how to find it's interval of convergence up to the endpoints by using the ratio test.

  You should be able to determine a radius of convergence and understand what it means.

- Taylor Polynomials and Taylor series:

  Know what a Taylor Series is and how to compute one by taking derivatives.

  Be able to center a Taylor series at $x = b$ provided f and all its derivatives exist at $x = b$.

1

Know the Maclaurin series for
$$\frac{1}{1-x}, \sin x, \cos x, e^x, \text{ and } (1+x)^k$$
(and the associated radii of convergence) and be able to use them to get new Taylor series by substitution, integration or differentiation. For instance, you'd never finish an exam if you were to try to find the series for $sin(x^2)$ by taking derivatives rather than by substitution.

Note: you should realize that if you know the Taylor Series for $f(x)$ about $x = 0$ you generally CANNOT find the series for $f(x)$ about $x = 5$ by simply subsituting $(x - 5)$ for x in the Maclaurin series for f.

Understand the basic idea of approximating a function around a point by a polynomial.

Be able to use a Taylor polynomial to approximate a function and, in the simplest cases, be able to use either the Alternating Series Error estimate or Taylor's Remainder to bound the error in the approximation. We won't be stressing the Taylor remainder in more complicated cases.

Before worrying too much, try to see how much of this you already know. Then spend some time thinking about how it all fits together.

On the web are some materials you can use for reviewing for the upcoming examination. And at this point we've basically talked about all the "new" topics in series that we'll be discussing - so you've got some time to let this all sink in. Remember that in addition to the question center hours and office hours there are 6 math 1b problem sessions running every week. You are welcome to go to any and as many as you wish. Problem sessions are a great way to see more problems worked - and they are part of the course. I encourage you to make use of them! (Schedules are posted on our website. Look for the link.)