My Office Hours: M & W 2:30–4:00, Tu 2:00–3:30, & F 1:30–2:30 or by appointment. **Math Intern:** Sun: 2:00–5:00, 7:00–10pm; Mon thru Thu: 3:00–5:30 and 7:00–10:30pm in Lansing 310. Website: `http://math.hws.edu/~mitchell/Math131F15/index.html`.

Final Exam: Thursday, December 17, 2015 8:30–11:30 AM, Gulick 206A

This is the exam time is for our lab period in our lab room, Gulick 206A.

Review/Practice Session. Monday, December 14 from 10:15 AM to 11:45 AM in Gulick 206A. Look for Practice Questions on line starting on Friday. In the mean time, review the Labs, especially Labs 13 and 14. The answers to all the labs and all the homework are on line.

☕ *Practice.* **Review Section 9.2** on **Power Series** through page 678. Skim the last few pages of the section. Look at the notes online. Try page 678 #9, 11, 13, 17, 19.

1. **Vocabulary**: power series, radius of convergence, interval of convergence.

Hand In At Lab

Be neat. Carefully justify your work. Make this your best assignment.

0. Last WeBWorK: `Day41`.

Finding the Radius and Interval of Convergence. This requires finding the radius of convergence and then checking the endpoints. **Note:** There are lots of similar problems on line in the notes.

(*a*) $\displaystyle\sum_{k=0}^{\infty} \frac{x^k}{k3^k}$.

(*b*) $\displaystyle\sum_{n=0}^{\infty} \frac{3^n x^{n+1}}{(2n)!}$.

(*c*) $\displaystyle\sum_{k=0}^{\infty} k!(x+4)^k$.

(*d*) Try this. I will give you extra credit. It is not hard: $\displaystyle\sum_{n=0}^{\infty} \frac{5(x-2)^n}{2^n}$.

(*e*) Another Bonus: $\displaystyle\sum_{n=0}^{\infty} \frac{(x-3)^{2n}}{(-4)^n n}$.

THEOREM 0.0.1. Convergence of Power Series. For a power series $\displaystyle\sum_{n=0}^{\infty} c_n(x-a)^n$ centered at a, precisely one of the following is true.

(*a*) The series converges only at $x = a$. ($R = 0$)

(*b*) There is a real number $R > 0$ so that the series converges absolutely for $|x-a| < R$ and diverges for $|x-a| > R$.

(*c*) The series converges for all x. ($R = \infty$)

NOTE: In case (b) the power series may converge at both endpoints $a-R$ and $a+R$, either endpoint, or neither endpoint. You must check the convergence at the endpoints separately. Here's what the intervals of convergence can look like:

$$[a-r, a+r] \qquad [a-r, a+r) \qquad (a-r, a+r] \qquad (a-r, a+r)$$