Math 131 Day 38

My Office Hours: M & W 12:30–2:00, Tu 2:30–4:00, & F 1:15-2:30 or by appointment. **Math Intern** Sun: 12–6pm; M 3-10pm; Tu 2–6, 7–10pm; W and Th: 5-10 pm in Lansing 310. Website: `http://math.hws.edu/~mitchell/Math131S13/index.html`.

Reading

1. a) ReadSection 9.1 on Taylor Polynomials, through page 595.

b) **Review** Section 8.6 on Alternating Series. Skip from the bottom of page 580 through 581. Then read pages 582–594. Also review the **online notes**. You should know the definitions of **Absolute** and **Conditional Convergence**.

c) Review the chart on page 584. It is a good guide to

2. Review the Handout on Taylor Polynomials.

Two Newest Tests

1. The Alternating Series Test. Assume $a_n > 0$. The alternating series $\sum_{n=1}^{\infty}(-1)^n a_n$ converges if the following two conditions hold:

a) $\lim_{n\to\infty} a_n = 0$

b) $a_{n+1} \le a_n$ for all n (i.e., a_n is decreasing).

2. Absolute Convergence Test. If the series $\sum_{n=1}^{\infty} |a_n|$ converges, then so does the series $\sum_{n=1}^{\infty} a_n$.

Practice

1. Basics: Page 585 #11, 13, and 17. More interesting: Page 585 #21 and 23.

2. Do you understand the difference between absolute and conditional convergence: Page 585 #39, 41, 43, and 45.

Hand In

1. Determine whether the following series converge conditionally, absolutely, or not at all. What strategy may save you work?

a) $\sum_{n=1}^{\infty} \frac{(-1)^n}{\sqrt[3]{n^4+1}}$ **b)** $\sum_{n=1}^{\infty} \frac{\cos(n\pi)}{\sqrt{n+10}}$ **c)** $\sum_{n=1}^{\infty} \frac{(-7)^{n+1}}{n!}$

2. a) Page 585 #44

b) Determine whether $\sum_{n=1}^{\infty}(-1)^n \frac{(n!)^3}{(3n)!}$

3. Taylor polynomials. Let $f(x) = e^{-x}$. Determine $p_5(x)$ centered at $a = 0$. Then use the pattern to determine $p_n(x)$. Write your answer using summation notation.

4. Taylor polynomials. Let $f(x) = \ln(x+1)$. Determine $p_4(x)$ centered at $a = 0$. Then use the pattern to determine $p_n(x)$. Write your answer using summation notation, if you can.

5. Work on WeBWorK TaylorPoly (2 problems, Due Tuesday). Finish WeBWorK Day 37 (Due Sunday night.)