Spring 2019 Math 152

Week in Review 8

courtesy: Amy Austin

(covering section 11.6, 11.8)

Section 11.6

1. Determine whether the following series converge absolutely, convege conditionally, or diverge.

   a.) $\sum_{n=1}^{\infty} \frac{(-1)^n}{\sqrt{n}}$

   b.) $\sum_{n=1}^{\infty} \frac{(-1)^n n}{n+1}$

   c.) $\sum_{n=1}^{\infty} \frac{(-1)^n}{n^3+n}$

   d.) $\sum_{n=2}^{\infty} \frac{(-1)^n}{n(\ln n)^2}$

   e.) $\sum_{n=2}^{\infty} \frac{\cos n}{n^4}$

   f.) $\sum_{n=2}^{\infty} \frac{(-1)^n}{6n+2}$

   g.) $\sum_{n=1}^{\infty} \frac{(-9)^n}{5^n n^{10}}$

   h.) $\sum_{n=1}^{\infty} \frac{(-7)^n}{(n+2)!}$

2. Explain why the Ratio Test is or is not conclusive (you decide which) for the following series:

   a.) $\sum_{n=1}^{\infty} \frac{(-1)^n}{n+2}$

   b.) $\sum_{n=1}^{\infty} \frac{(-7)^n n!}{(2n+1)!}$

Section 11.8

3. For the following power series, find the radius and interval of convergence.

   a.) $\sum_{n=1}^{\infty} \frac{(-4)^n x^n}{n^2+5}$

   b.) $\sum_{n=1}^{\infty} \frac{(-1)^n (3x-1)^n}{\sqrt{n}}$

   c.) $\sum_{n=0}^{\infty} \frac{(2n)!(x+2)^n}{100^n}$

   d.) $\sum_{n=0}^{\infty} \frac{(x-1)^n}{(2n+1)!}$

4. Suppose it is known that $\sum_{n=0}^{\infty} c_n x^n$ converges when $x = 4$ and diverges when $x = -10$. What can be said about the convergence or divergence of the following series, if anything?

   a.) $\sum_{n=0}^{\infty} c_n (8)^n$

   b.) $\sum_{n=0}^{\infty} c_n (-3)^n$

   c.) $\sum_{n=0}^{\infty} c_n (12)^n$

   d.) $\sum_{n=0}^{\infty} c_n (-4)^n$