Spring 2008 Math 152

courtesy: Amy Austin
(covering section 10.5-10.6)

Section 10.5

1. 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.) $\sum_{n=1}^{\infty} \frac{(-2)^n (3x-1)^n}{\sqrt{n}}$

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

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

2. Suppose it is known that $\sum_{n=0}^{\infty} c_n (x)^n$ converges when $x = -4$ and diverges when $x = 6$. What can be said about the convergence or divergence of the following series:

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

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

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

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

Section 10.6

3. Express the following functions as a power series. Identify the radius of convergence.

   a.) $f(x) = \frac{1}{1-8x}$

   b.) $f(x) = \frac{1}{2+x^2}$

   c.) $f(x) = \frac{x^4}{5-x}$

   d.) $f(x) = \ln(x+15)$

   e.) $f(x) = \arctan(2x)$

   f.) $f(x) = \frac{1}{(1-2x)^2}$

4. Express $\int_0^{1/2} \frac{1}{1+x^5}\,dx$ as an infinite series.

5. Evaluate $\int_0^{0.1} \frac{1}{1+x^3}\,dx$ with error less than .01.