Fall 2005 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.) $\sum_{n=0}^{\infty} \frac{2^n x^n}{n^2+2}$

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

   c.) $\sum_{n=0}^{\infty} \frac{n!(x+2)^{n-1}}{5^{n-1}}$

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

Section 10.6

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

   a.) $f(x) = \frac{1}{1-5x}$

   b.) $f(x) = \frac{1}{1+4x^2}$

   c.) $f(x) = \frac{3x^2}{9-x}$

   d.) $f(x) = \ln(x+4)$

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

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

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