

## 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.