

Math 181
Fall, 2008

Name _____

Homework #16

Due Wednesday, November 12
No late papers accepted! No excuses!

1. Find the Taylor series generated by f at $x = a$.

$$f(x) = \frac{1}{x^2}, \quad a = 1$$

2. Using the Taylor Series

$$\ln(1+x) = x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \dots,$$

find a Taylor series centered at $x = 0$ for $x \ln(1+2x)$

3. Find a series solution for the initial value problem.

$$y'' - 2y' + y = 0$$

$$y'(0) = 1$$

$$y(0) = 0$$

4. Use a power series to evaluate the limit.

a) $\lim_{\theta \rightarrow 0} \frac{e^\theta - e^{-\theta} - 2\theta}{\theta - \sin \theta}$

b) $\lim_{y \rightarrow 0} \frac{y^2}{\cos y - \cosh y}$