Third Exam
Tuesday, April 12, 2016

This exam is closed book, but you may use calculators. Make sure your name is on all pages. Show all work, and show it in a logical and organized manner. The first two problems are each worth 25 points, and the third problem is worth 50 points.

1. Consider the power series: $\displaystyle\sum_{n=0}^{\infty} \frac{1}{3^n}(x-1)^n$.

   (a) Determine its radius of convergence.

   (b) Write down the interval in which it converges.

2. Write down the first 4 terms for the Taylor series about $x_0 = 0$ for $f(x) = e^{2x}$.

3. Write down the first four terms of the series solution to the following initial value problem.

$$y'' + xy' + x^2y = 0, \quad y(0) = 1, \ y'(0) = 1.$$