Third Exam

Tuesday, November 13, 2012

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. You may keep this exam sheet.

1. Consider

$$y'' + xy = 0. \tag{1}$$

   (a) Write down the terms up to and including degree 5 for the Taylor series for y_1 and y_2, where the general solution of (1) is

   $$y(x) = a_0 y_1(x) + a_1 y_2(x).$$

   (b) Write down the terms up to and including degree 5 of the solution of the initial value problem consisting of (1) and the initial conditions $y(0) = 1$, $y'(0) = 0$.

2. Find the general solution to the equation

$$x^2 y'' - 2y = 0.$$