

Homework #10

Math 527, UNH fall 2011

Due Wednesday, Nov. 9 in lecture.

Problems 1–4: Find two linearly independent power-series solutions of the ODE, centered about $x = 0$, and give a lower bound on the radius of convergence of each solution. If the power series does not simplify to a known function, provide the first four terms. These problems are from the Zill textbook, exercises 6.1 problems 17, 21, 23, 26 so you can check your answers in the back of the book for the first three.

1. $y'' - xy = 0$

2. $y'' + x^2y' + xy = 0$

3. $(x - 1)y'' + y' = 0$

4. $(x^2 + 2)y'' - 6y = 0$

Problem 5: Use the power series method to solve the initial value problem (Zill 6.1 problem 29).

5. $(x - 1)y'' - xy' + y = 0, \quad y(0) = -2, \quad y'(0) = 6$