

MATH 319, Fall 2013, Assignment 8

Textbook Questions

Section 5.1, #2 Determine the radius of convergence of the power series

$$\sum_{n=0}^{\infty} \frac{n}{2^n} x^n$$

#7 Determine the radius of convergence of the power series

$$\sum_{n=1}^{\infty} \frac{(-1)^n n^2 (x+2)^n}{3^n}$$

#23 Rewrite the following expression as a sum whose generic term involves x^n :

$$x \sum_{n=1}^{\infty} n a_n x^{n-1} + \sum_{k=0}^{\infty} a_k x^k$$

Section 5.2, (a) Find the power series solution of the following differential equation about the given point x_0 ; find the recurrence relation. (b) Find the first four terms in each of two solutions $y_1(x)$ and $y_2(x)$ (unless the series terminates sooner). (d) If possible, find the general term in each solution.

#5

$$(1-x)y''(x) + y(x) = 0, \quad x_0 = 0$$

#8

$$xy''(x) + y'(x) + xy(x) = 0 \quad x_0 = 1$$