

Math 105 Week 12 Learning Goals

1 Overview

Last week we started on infinite series. In particular we learned about two tests of convergence and/or divergence: namely the divergence test and the integral test. This week we will learn a few more such tests designed to verify convergence or divergence of an infinite series, even when we cannot evaluate the series exactly. We will then begin the study of a very special class of functions whose functional forms are given by infinite series.

2 Learning Objectives

These should be considered a minimum, rather than a comprehensive, set of objectives. By the end of the week, having participated in lectures, worked through the indicated sections of the textbook and other resources, and done the suggested problems, you should be able to independently achieve all of the objectives listed below.

1. state the ratio test, comparison test and limit comparison test for convergence or divergence of an infinite series with positive terms. [Recall/Conceptual]

You are not responsible for the root test.

2. use the tests learned so far to check if an infinite series converges or diverges. Be able to recognize forms that indicate the applicability or otherwise of certain tests. [Procedural]

3. give the definition of absolute and conditional convergence. Give examples of some absolutely convergent and some conditionally convergent series (p.654). [Recall] Reading: Text §8.5 (pp. 641 – 647)

4. define a power series, and the radius of convergence of a power series. Use the radius of convergence to determine an interval where the series converges absolutely. [Recall]

5. given a power series, be able to find the radius of convergence of a power series. [Procedural]

You will not be expected to determine the convergence of a series at the endpoints of its interval of convergence. For intervals of convergence, you need only determine the largest open interval of absolute convergence for a power series.

6. Be comfortable with algebraic manipulations of power series, such as sums, differences, multiplication by a power, composition, integration and differentiation. [Procedural]

Reading: Text § 9.2 (pp. 675 – 682)