

Math 199, Spring 2022  
Yigal Kamel  
4/8/22

### Preparation Assignment 11 - Stepping back: series

**Estimated Time:** 30-45 minutes.

**Goals:** The goal of this assignment is for you to collect various things that we learned about series in one place. This will both help prepare you for the upcoming exam, and help you solidify and string together some of the themes of the recent weeks.

- 1) Write down a list of every convergence test for series that we have learned, and indicate when each test might be useful. Also indicate which of these tests actually tell us how to compute the sum of the series when it converges.
- 2) Write down a list of Taylor series for some of the common functions that we care about. Include as many functions as you can.
- 3) Write down two different ways you might find a Taylor series of a function.
- 4) What are the different kinds of convergence of a series? When does a series converge in one way as opposed to another?
- 5) (a) Write down a list of series that you know converge.  
  
(b) Write down a list of series that you know diverge.

Make these lists as long as you can. Doing this will make the comparison tests very powerful tools for you. Try to think about how these series will help you determine when other series converge or diverge.

6) *Bonus:* Make a list of every definition and theorem from the class notes (and/or textbook) that we've covered since the last exam. You'd be surprised at how helpful this can actually be.