

M408S Homework 12. Due Monday, April 15

Part 1: Strategies for convergence

Stewart page 740-741, problems 2, 16, 22, 28, 30, 36. In each case indicate whether the series is divergent, conditionally convergent or absolutely convergent. By now you should be pretty comfortable with the different tests, so you don't need to spell out your reasoning in gory detail. It's enough to say something like "this series converges by the Alternating Series Test, but  $\sum |a_n|$  doesn't converge by limit comparison to  $\sum 1/n$ , so it's conditionally convergent."

Part 2: Power series

1 a) Find a power series whose interval of convergence is  $(-1, 1)$ . There are *many* correct answers!

b) Find one whose interval of convergence is  $[-2, 2]$ .

c) And one whose interval of convergence is  $(-3, 3]$ .

d) And one whose interval of convergence is  $[-4, 4)$ .

e) And one whose interval of convergence is  $(4, 16]$ .

f) And one whose interval of convergence is  $(-\infty, \infty)$ .

2) Suppose that  $\sum a_n x^n$  converges when  $x = 5$  and diverges when  $x = -6$ . What (if anything) can you say about its convergence when  $x = -4$ ? When  $x = -5$ ? When  $x = 7$ ? When  $x = 5.5$ ?

Stewart pages 745-6, problems 2, 36a, 42.