READING ASSIGNMENT 14

NAME: SOLUTIONS

§11.4 (Absolute and Conditional Convergence)

Due 26 July 2018

LEARNING OBJECTIVES

By the end of this lesson, you will be able to:

- define absolute and conditional convergence for a series,
- determine absolute and conditional convergence of alternating series using the alternating series test or another method.

REVIEW

- None.

READING

- Read §11.4 in the textbook.

QUESTIONS

(1) True or false?

(a) If $\sum_{n=0}^{\infty} |a_n|$ diverges, then $\sum_{n=0}^{\infty} a_n$ also diverges.

SOLUTION: False. See solution to question 2.

(b) If $\sum_{n=0}^{\infty} a_n$ diverges, then $\sum_{n=0}^{\infty} |a_n|$ also diverges.

SOLUTION: True. $\sum_{n=0}^{\infty} |a_n| \geq \sum_{n=0}^{\infty} a_n$, so if the latter diverges, so must the former.

(c) If $\sum_{n=0}^{\infty} a_n$ converges, then $\sum_{n=0}^{\infty} |a_n|$ also converges.

SOLUTION: False. See solution to question 2.

(2) Give an example of a series that converges but not absolutely.

SOLUTION: The alternating harmonic series

$$\sum_{n=1}^{\infty} \frac{(-1)^n}{n}$$

converges, but the harmonic series

$$\sum_{n=1}^{\infty} \frac{1}{n}$$

diverges.