

MATH 2060B - HW 7
Due Date: 19 April 2021, 23:59

Problems: Ex9.3 P.280: 1c, d; 9, 14

(3 Questions in total)

Textbook: Bartle RG, Sherbert DR(2011). Introduction to Real Analysis, fourth edition, John Wiley Sons,Inc.

Instruction:

1. Please submit your solution in one pdf file to Blackboard.
2. Rename your file in the form "HW1_ChanTaiMan_1155151031".
3. You are reminded that your HW is graded based on **both** your idea and your presentation

Questions:

1 (P.280 Q1c,d). For each of the following series,

- i. determine if it converges
- ii. determine if it converges absolutely

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

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

2 (P.280 Q9). Let $\sum a_n$ be a series. Suppose the sequence of partial sum (s_n) of the series $\sum a_n$ is bounded. Show that the series $\sum_{n=1}^{\infty} a_n e^{-nt}$ converges for $t > 0$.

3 (P.280 Q14). Let $\sum_{k=1}^{\infty} a_k$ be a series with sequence of partial sums (s_n) . Suppose there exists $r < 1$ and $M > 0$ such that $|s_n| \leq Mn^r$ for all $n \in \mathbb{N}$. Show that the series $\sum_{n=1}^{\infty} \frac{a_n}{n}$ converges.