

MAT 319 Introduction to Analysis

Homework 9

due Thursday, April 12

Please prove (or explain as appropriate) all your answers.

In class, we proved the following important

Theorem. A continuous function $f : [a, b] \rightarrow \mathbb{R}$ attains its maximum. (See second part of Thm 18.1 in the book.)

Prove that a continuous function $f : [a, b] \rightarrow \mathbb{R}$ also attains its minimum. Give two different proofs:

- (1) Do exercise 18.1 in the book to show that the statement about minimum can be derived from the statement about maximum.
- (2) Mimic the proof for the maximum (adapt it to obtain the proof for minimum).

Please do questions 18.5, 18.7, and 18.8 from the book.