

MATH 352: HOMEWORK 3
DUE TUESDAY FEBRUARY 9

Finish reading Chapter 4.

- (1) Finish the proof of the Intermediate Value Theorem using the Axiom of Completeness.
- (2) Prove or disprove: If $f : A \rightarrow \mathbb{R}$ is monotone and bounded on A , then f is continuous.
- (3) Prove or disprove: If $f : A \rightarrow \mathbb{R}$ is monotone and continuous on A , then f is bounded.
- (4) Prove or disprove: If $f : A \rightarrow \mathbb{R}$ is a monotone, continuous function, then f is uniformly continuous.
- (5) Prove or disprove: If A is a bounded set and $f : A \rightarrow \mathbb{R}$ is continuous, then f is uniformly continuous.
- (6) Prove or disprove: If A is a bounded set and $f : A \rightarrow \mathbb{R}$ is continuous and monotone on A , then f is uniformly continuous.
- (7) Prove or disprove: If A is a closed set and $f : A \rightarrow \mathbb{R}$ is continuous and monotone on A , then f is uniformly continuous.
- (8) Prove or disprove: If A is a closed and bounded set and $f : A \rightarrow \mathbb{R}$ is continuous and monotone on A , then f is uniformly continuous.