M 383: Assignment 6

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Exercises 3.2.3 — Problem 1

Problem. Show that compact sets are closed under arbitrary intersections and finite unions.

Proof.

Exercises 3.3.1 — Problem 4

Problem. If $A \subset B_1 \cup B_2$ where B_1 and B_2 are disjoint open sets and A is compact, show that $A \cap B_1$ is compact. Is the same true if B_1 and B_2 are not disjoint?

Proof.

Exercises 3.3.1 — Problem 8

Problem. If A is compact, show that $\sup A$ and $\inf A$ belong to A. Give an example of a non-compact set A such that both $\sup A$ and $\inf A$ belong to A.

Proof.