

BOWDOIN COLLEGE

MATH 2603: INTRODUCTION TO ANALYSIS
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HOMEWORK 5

1. Show that the union of two compact sets is compact.
2. Suppose that T is closed and U is compact. Show that $T \cap U$ is compact.
3. Show that if T_i is compact for every $i \in I$, then so is the intersection $\bigcap_{i \in I} T_i$.
4. Prove the following proposition. We will use it a number of times in the course to show that two points of a metric space are equal.

Proposition. *Consider points p and p' in a metric space (S, ρ) . If $\rho(p, p') < \epsilon$ for every $\epsilon > 0$, then $p = p'$.*