## Math 441 - Homework 6

## Due Friday, Oct. 9

- 1. Let  $\{A_{\alpha} : \alpha \in \mathcal{A}\}$  be any collection of open sets. Prove that  $\bigcup_{\alpha \in \mathcal{A}} A_{\alpha}$  is an open set.
- 2. Prove that any intersection of compact sets is compact.
- 3. Prove that every open set in  $\mathbb{R}$  is a union of open intervals. Hint: prove that it is a union of neighborhoods.