

## MAS241 ANALYSIS I QUIZ 4

**Problem 1.** (15 points) *Prove or disprove. If the statement is wrong, give a counterexample.*

- (1) *For every set  $S$  in  $\mathbb{R}^n$ , the complement of  $S^0$  is the closure of  $S^c$*
- (2) *For every set  $S$  in  $\mathbb{R}$ , the closure of  $S$  and  $S$  have the same interiors.*
- (3) *For every set  $S$  in  $\mathbb{R}$ , the interior of  $S$  and  $S$  have the same closures.*

**Problem 2.** (15 points) *Prove that  $\mathbb{R}$  is connected and the only clopen(both close and open) subsets of  $\mathbb{R}$  are  $\emptyset$  and  $\mathbb{R}$*