GENERAL TOPOLOGY
HOMEWORK FOR WEEK 1

Exercise 1. *Let A be an open set in a topological space X. Prove that* $\operatorname{int} \partial A = \emptyset$.

Exercise 2. *Consider the open quarter spaces in $\mathbb{R}^2$, which are sets of the form:*

$$Q_{a,b} = \{(x,y) \in \mathbb{R}^2 : x > a \text{ and } y > b\}.$$

Show that the sets $Q_{a,b}$, where $a, b \in \mathbb{R}$, form a basis for a topology on $\mathbb{R}^2$. Calculate the closure of the set $A = \{(x, -x) : x \in \mathbb{R}\}$ in this topology. (Geometric reasoning is allowed)