

GENERAL TOPOLOGY
HOMEWORK FOR WEEK 1

DEADLINE: MON 3.3, 23:59

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

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)