

## Open and Closed Sets

Problem 1. If  $A$  is a closed set that contains every rational number  $r \in [0, 1]$ , show that  $[0, 1] \subset A$ .

Problem 2. Find the interior, exterior, and boundary of:

a)  $x \in \mathbb{R}^n: \|x\| < 1$

b) The collection of open intervals  $(\frac{1}{n}, \frac{1}{n+1})$ :  $n \in \mathbb{Z}$

Problem 3. Find an open cover for:

a) The closed interval  $[-1, 1]$

b) The set of all rational numbers.