

**Math 535 - General Topology**  
**Fall 2012**  
**Homework 12, Lecture 11/12**

**Problem 1.** Consider the open cover  $\mathcal{U} = \{B_1(x)\}_{x \in \mathbb{R}}$  of  $\mathbb{R}$  by open balls of radius 1, i.e. open intervals  $B_1(x) = (x - 1, x + 1)$ . Find a partition of unity on  $\mathbb{R}$  subordinate to  $\mathcal{U}$ .

**Problem 2.** Let  $X$  be a second-countable locally compact space. Show that  $X$  is  $\sigma$ -compact.