

**Math 535 - General Topology**  
**Fall 2012**  
**Homework 12, Lecture 11/14**

**Problem 3.** Show that any closed subspace  $C \subseteq X$  of a paracompact space  $X$  is paracompact.

**Problem 4.** Let  $\{X_i\}_{i \in I}$  be a collection of topological spaces and let  $X := \coprod_{i \in I} X_i$  denote their coproduct.

**a.** Show that an arbitrary coproduct of paracompact spaces is paracompact. In other words, if each  $X_i$  is paracompact, then so is  $X$ .

**b.** Show that the converse holds: If the coproduct  $X$  is paracompact, then so is each summand  $X_i$ .

**c.** Show that a coproduct of compact spaces is compact if and only if the collection is finite. In other words, assume each  $X_i$  is compact, and show that their coproduct  $X$  is compact if and only if the indexing set  $I$  is finite.