

MA651 Topology. Homework 5

Homework due March 7, 2006

1. Find the mistakes in the lecture notes (I have intentionally made several mistakes, and you might find even more).
2. Consider the questions given as a homework in the lecture notes (i.e. prove Theorem 31.1, Example 35.4, Corollary 35.1)
3. Let $X_1 = \{0, 1\}$, and T_1 the Sierpinski topology (i.e. $T_1 = \{\emptyset, \{0\}, X_1\}$). Let $X_2 = \{a, b\}$, and T_2 the indiscrete topology (i.e. $T_2 = \{\emptyset, X_2\}$). List the subbasic open sets of the product topology on $\prod_{i=1}^2 X_i$.
4. Is the image of a disconnected space under a continuous map necessarily disconnected?