Mth 436 Topology Homework 1

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Due Wednesday February 4, 2013

All problems are worth 20 points, including bonus problems which are extra credit.

1. Prove that for a topological space $(X, \mathcal{T})$, a subset U of X is open if and only if it is a neighbourhood of every one of its points.

2. Let X be a (non-empty) set and consider all subsets U of X whose complement $X \setminus U$ is (at most) countable. Show that the collection of all such sets gives a topology on X.