MA651 Topology. Homework 4

Homework due February 28, 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 Propositions 25.1, 28.2)

3. Show that the function
$$\phi(x) = \begin{cases} x & \text{if } x \leq 0 \\ 0 & \text{if } x \geq 0 \end{cases}$$

   $\phi : R \to R$ is continuous, where R real line with the Euclidean topology

4. Let in the topological space X exist 2 everywhere dense sets A and B, such that $A \cup B = X$, $A \cap B = \emptyset$, $\bar{A} = \bar{B} = X$. Let us define $f(x) : X \to X$ as

$$f(x) = \begin{cases} 0 & \text{if } x \in A \\ 1 & \text{if } x \in B \end{cases}$$

   Prove or disprove that $f(x)$ is continuous.