

HW 11

The due date for these problems is Tuesday, April 26.

1. Problem 51 from the textbook.
2. Consider the metric space $(\mathbb{R}, |\cdot|)$ with the Euclidean topology. Give, with brief proof, an example to show a countably infinite intersection of open sets can be a closed set.
3. Consider $(\mathbb{R}, |\cdot|)$ with the Euclidean topology, and $X = (0, 1]$ the topological space with the topology induced by $(\mathbb{R}, |\cdot|)$. Give an example of a set $A \subsetneq X \subseteq \mathbb{R}$ that is open in the induced topology on X , but not in \mathbb{R} . Give an example of a set $B \subsetneq X \subseteq \mathbb{R}$ that is closed in the induced topology on X , but not in \mathbb{R} . Justify briefly.
4. Problem 58 (2), (3) from the textbook. You may assume (1) is proved.