

PMAT 505 ASSIGNMENT 5 Due December 10, 2010

1. Munkres p.199, 2. [10]
2. Munkres p. 199, 3. [10]
3. Munkres p. 199, 6⁺. Let $p : X \rightarrow Y$ be continuous, closed, and surjective. Show that if X is T_4 then so is Y [a hint can be found in the text]. [20]
4. Let X be a Hausdorff space having infinite cardinality.
 - (a) Show that there exists a non-empty open subset $U \subset X$ such that $X \setminus U$ is infinite.
 - (b) Show that there exist an infinite family of mutually disjoint non-empty subsets of X . [20]
5. Munkres, p.205, 6. [20]
6. Munkres, p.213, 7. [Hint : Start the proof by applying local compactness to the situation $x \in X$ and B is a closed subset with $x \notin B$, so that $X \setminus B$ is an open neighbourhood of x .] [20]