

Math 131B-2: Homework 2

Due: April 14, 2014

1. Read sections 3.1-2, 3.6-11 in Apostol.
2. Do problems 3.26, 3.30, 3.31, 3.2(a)-(d),(f),(g), 3.12(b),(c),(f), 3.43, and 3.46 in Apostol. (We did the other parts of 3.12 in class.)
3. Consider the metric space $S = (0, 1] \times [2, 3) \subset \mathbb{R}^2$, equipped with the metric it inherits as a subspace of the standard metric on \mathbb{R}^2 . Let $A = (.5, 1] \times (2, 2.3)$ and $B = \{(\frac{1}{n^2}, 2 + \frac{1}{n}) : n \in \mathbb{N}\}$. What are the closures and interiors of A and B in S ?
4. Let (M, d') be any infinite set M with the discrete metric (i.e. $d'(x, y) = 1$ when $x \neq y$). Let S be any infinite subset of M . Show that S is closed and bounded, but not compact.