

Math 131A Lecture 2 Homework 3 – Due Apr. 17

Note: Group work is permitted on the homework provided that each person writes their own answer in their own words. However, to obtain any major benefit from the homework, it is recommended that the student spend significant time and effort attempting each problem before collaborating or seeking help from the teacher/teaching assistant/other students.

Problem 1: Suppose that B is a countable set. Show for every $k \in \mathbb{N}$ that B^k is countable, where $B^1 = B$ and B^k is defined recursively $B^k = B \times B^{k-1}$ for $k \geq 2$ (*hint:* use induction and the fact, proven in class, that $C_1 \times C_2$ is countable whenever C_1 and C_2 are countable).

From the textbook:

Section 1.4: #1.4.7, 1.4.8, 1.4.9, 1.4.12, 1.4.15, 1.4.16.