

As I write this assignment, I do not know whether we proved the 2D Brouwer fixed-point theorem (Theorem 55.6) in today's class meeting. If not, then we will prove it in the next class meeting. Anyway, you may assume this result as you do the following problems.

A. Section 55 Exercise 1, which is about a retract of \mathbb{B}^2 . (This is a short exercise.)

B. Section 55 Exercise 2, which is about a map $h : \mathbb{S}^1 \rightarrow \mathbb{S}^1$. (This exercise is of medium length. Actually, it's a short exercise followed by a short-medium exercise.)

C. Section 55 Exercise 3, which is about matrices. (This exercise is of medium length. You might want to digest the proof of Corollary 55.7 before beginning.)