

ASSIGNMENT 5

Due date Monday 27th of April

- (1) Question 15 parts a and d page 106 of the textbook
- (2) Question 19 page 106 of the textbook
- (3) How many roots does the equation $Z^4 + 8z^3 + 3z^2 + 8z + 3$ have in the right half plane?
- (4) Brouwer's fixed point theorem states that any continuous mapping of the disk to itself must have a fixed point. The aim of this exercise is to prove a variant of Brouwer's fixed point theorem. Suppose g is a holomorphic function mapping the closed unit disk into itself. In other words, the image under g of the closed unit disk is contained in the interior of the unit disk. Show that g has a unique fixed point in the unit disk. Hint: compare with the function $f(z) = -z$.