MATH 224 : COMPLEX ANALYSIS

SPRING 2016

HOMEWORK 11

Instructor: GAUTAM BHARALI **Assigned: APRIL 9, 2016**

NOTE: In this assignment, $\mathbb{D}$ will denote the open unit disc with centre at $0 \in \mathbb{C}$.

1. Let $\Omega := \{z \in \mathbb{D} : |\mathsf{Arg}(z)| < 3\pi/4\}$. Construct a biholomorphism of Ω onto $\mathbb{D}$.

2. Let Ω be an **unbounded** domain such that $\mathbb{C} \setminus \Omega$ has non-empty interior. Fix a point $a \in \Omega$. Show that Ω admits a holomorphic function $f : \Omega \longrightarrow \mathbb{D}$ such that f is injective, $f(a) = 0$ and $f'(a) > 0$. (Note that we have **not** assumed that Ω is simply connected, whence f cannot be bijective.)

3–4. Problems 2 and 3 from the exercises to VII–Secn. 4 of Conway.