# Complex Analysis, HW # 5

**Chapter 6, problems 11, 17, 18, 21, and these problems:**

## Problem 1.

Suppose $f \in \operatorname{Aut} \widehat{\mathbb{C}}$ is a linear-fractional transformation that has two distinct fixed points $a$ and $b$. Prove that $f'(a)f'(b) = 1$.

## Problem 2.

Set $f(z) = z/2$, $g(z) = z/3$. Prove that there is no conformal change of coordinates $\phi : \mathbb{C} \to \mathbb{C}$ such that $g \circ \phi(z) = \phi \circ f(z)$ for all $z \in \mathbb{C}$, but there exists a homeomorphism $h : \mathbb{C} \to \mathbb{C}$ (i.e. continuous change of coordinates) such that $g \circ h(z) = h \circ f(z)$ for all $z \in \mathbb{C}$.

## Problem 3.

Suppose $f : \mathbb{D} \to \mathbb{D}$ is holomorphic, and $f(0) = 0$. Prove that either $f$ is a rotation of the unit disc, or the sequence of iterates $\{f^n\}$ converge to zero uniformly on compact subsets of $\mathbb{D}$.