MATH 351: RIEMANN SURFACES AND DESSINS D'ENFANTS
HOMEWORK #5

Problem 5.1. Show that the map

$$f : \mathbb{P}^1(\mathbb{C}) \to \mathbb{S}^2$$

$$[z_0 : z_1] \mapsto \frac{1}{|z_0|^2 + |z_1|^2} \left(2\operatorname{Re}(z_0\overline{z_1}), 2\operatorname{Im}(z_0\overline{z_1}), |z_0|^2 - |z_1|^2 \right)$$

is an isomorphism of Riemann surfaces.

Problem 5.2. Show that the map

$$f : \mathbb{H} \to \mathbb{D}$$

$$z \mapsto \frac{z - i}{z + i}$$

is an isomorphism of Riemann surfaces. What is the inverse?