HOMEWORK #4, DUE WEDNESDAY OCTOBER 29TH

1. Find the Möbius transformation which carries 0, i and $-i$ to 1, -1 and 0.

2. Show that any four distinct points can be carried by a Möbius transformation to 1, -1, k and $-k$, for some k. How many possibilities for k are there and how are they related?

3. Find all circles which are orthogonal to $|z| = 1$ and $|z - 1| = 4$.

4. Find all linear transformations that carry the interior of the unit disc to the interior of the unit disc.

5. Find a conformal map that carries the region $\operatorname{Im} z > 0$ and $\operatorname{Re} z > 0$ to the interior of the unit disc.