Math 104 Homework 10
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Due Thursday, April 27, 2006

(1) **Symmetries of the conformal models.** Show that each of the following isometries (the "obvious symmetries" of the conformal models of $\mathbb{H}^2$) is a product of two hyperbolic reflections, and in each case decide whether it is a rotation, translation, or parabolic isometry of the hyperbolic plane:

    (a) A map $R : \Delta_P \to \Delta_P$ obtained by restricting a Euclidean rotation of $\mathbb{R}^2$ centered at $(0,0)$ to the unit disk.

    (b) The map $T_t : H \to H$ defined by $T_t(x,y) = (x+t, y)$, where $t \in \mathbb{R}$.

    (c) The map $D_t : H \to H$ defined by $D_t(x,y) = (tx, ty)$, where $t > 0$.

(2) **Further properties of isometries.** Complete exercises **7, 9, 10, and 14** on **p. 373** of Greenberg.