

# HOMWORK 8

MATH 435 Geometry  
Fall 2007

11/27/2007. Due on 12/04/2007

**Instructions:** Solve the following problems. Provide as much written detail as possible.

1. Let  $t : \mathbb{C} \rightarrow \mathbb{C}$  denote the inverse function  $t(z) = 1/z$ . Write  $t$  in terms of euclidean coordinates  $x, y$ . Recall that  $z = x + iy$ . Find the images of the following objects.

- The circle with radius 1 and centred at  $(2, 0)$ .
- The circle with radius 2 and centred at  $(-2, 0)$ .
- The line  $x = -y$ .
- The line  $2x + 4y = 1$ .
- The circle of radius  $r$  and centred at zero.
- Vertical and Horizontal lines.

In order to understand the geometric effect of this transformation, draw in the same plane the objects given above and their images (in different colors) under  $t$  and compare them.