

## Assignment 10

### Oral question

1. Assume  $a, b, c \in \mathbb{R}$  satisfy  $a^2 + bc = 1$ , and let  $T : \mathbb{C} \rightarrow \mathbb{C}$  be given by

$$T(z) = \frac{a\bar{z} + b}{c\bar{z} - a}.$$

Show that  $T(T(z)) = z$  for all  $z$ . (All reflections of the Poincaré upper half plane model are represented by such a function.)

### Question to be answered in writing

1. Find the Poincaré distance between the points  $P = 3 + i$  and  $Q = (6 + \sqrt{2})/2 + \sqrt{2}/2 \cdot i$  (in the Poincaré upper half plane model).