Quiz 1

Date : August 29, 2013,   Total time : 15 minutes, Total points : 20 points.

Name: _____   Reg.No.:_____

1. Prove that the map
$$\varphi(z) = \frac{z - i}{z + i} : \mathbb{C} \setminus \{-i\} \to \mathbb{C}$$
takes the real line $\{z = x + iy \in \mathbb{C} \mid y = 0\}$ to the unit circle $\{z \in \mathbb{C} \mid |z| = 1\}$.

9 points.

2. Compute the inverse ψ of the above map. Where is it defined?

4 points.

3. Let $\rho : \mathbb{C} \to \mathbb{C}$ be the reflection map $\rho(z) = \bar{z}$. Where does $\varphi \circ \rho \circ \psi$ make sense? Compute $\varphi \circ \rho \circ \psi(z)$.

6 points.

4. Does $\varphi \circ \rho \circ \psi$ look familiar to you? What is it?

1 point.