Due Date: 30 October 2014, Thursday – Class time NAME:.....

Ali Sinan Sertöz STUDENT NO:.....

Math 503 Complex Analysis – Homework 2

1	2	3	4	5	TOTAL
50	50	0	0	0	100

Please do not write anything inside the above boxes!

Check that there are **2** questions on your exam booklet. Write your name on top of every page. Show your work in reasonable detail. A correct answer without proper or too much reasoning may not get any credit.

NAME: STUDENT NO:

Q-1) Let S be the unit sphere in $\mathbb{R}^3$ centered at (a, b, c) with $c > -1$. Let $\alpha = a + ib$. Find a rigid motion T of S such that

$$P_{T(S)} \circ T \circ P_S^{-1}(z) = \frac{1}{z - \alpha},$$

where P_S denotes the stereographic projection to $\mathbb{C}$ from the North pole of the sphere S, and similarly for $P_{T(S)}$.

Solution:

NAME: STUDENT NO:

Q-2) Start with the unit sphere S centered at $(0, 0, k)$ with $k > -1$. Let $r > 0$ be a real number. Find a rigid motion T of S such that

$$P_{T(S)} \circ T \circ P_S^{-1}(z) = rz.$$

Solution: