Due Date: October 31, 2011 Monday NAME:.....

Ali Sinan Sertöz STUDENT NO:.....

Math 302 Complex Calculus II – Homework

3	4
10	10

Please do not write anything inside the above boxes!

Check that there are 2 questions on your 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.

Q-3) Classify all the automorphisms of the first quadrant

Solution:

NAME: STUDENT NO:

Q-4) This exercise aims to complete the proof of a theorem we did in class.

Fix $\alpha \in \mathbb{C}$ with $|\alpha| < 1$. Define

$$h(z) = \left(\frac{z-i}{z+i}\right)^{-1} \circ \left(\frac{z-\alpha}{1-\bar{\alpha}z}\right) \circ \left(\frac{z-i}{z+i}\right).$$

Show that

$$h(z) = \frac{az+b}{cz+d} \quad \text{with } a, b, c, d \in \mathbb{R} \text{ and } ad - bc > 0.$$

Solution: