Due Date: 25 March 2013, Monday NAME:..

Ali Sinan Sertöz STUDENT NO:..

Math 504 Complex Analysis II – Take-Home Exam 04

1	2	3	4	5	TOTAL
25	25	25	25	0	100

Please do not write anything inside the above boxes!

Check that there are **4** questions on your exam booklet. Write your name on top of every page. Show your work in reasonable detail.

For each question I will post the best student solution on the web. If there are more than one interesting solutions, I will post them all. Having your solution posted on the web will get you extra 10 points for each solution posted. These will be added to your total exam grades before an average is taken at the end of the semester.

NAME: STUDENT NO:

Q-1) Let b_1 b_2 be two complex numbers which are not congruent modΩ. Write down a function which is elliptic with respect to Ω and has poles at b_1 b_2 with principal parts

$$\frac{1}{z-b_1}+\frac{2}{(z-b_1)^2} \quad \text{and} \quad \frac{-1}{z-b_2}$$

respectively.
[page 122, Exercise 3S]

Solution:

NAME: STUDENT NO:

Q-2) Prove that the series $\sum_{n=1}^{\infty} z^{2^n}$ has the unit circle as its natural boundary.

[page 214, Exercise 4A]

Solution:

NAME: STUDENT NO:

Q-3) Prove that the point $z = 1$ is a singular point for the power series $\sum_{n=1}^{\infty} \frac{z^n}{n^2}$.

[page 214, Exercise 4B]

Solution:

NAME: STUDENT NO:

Q-4) Construct the Riemann surface of $\sin^{-1} z$.

[page 214, Exercise 4C]

Solution: