

Due Date: October 11, 2013 Friday

NAME:.....

Ali Sinan Sertöz

STUDENT NO:.....

Math 302 Complex Analysis II – Homework 1

1	2	3	TOTAL
10	10	10	30

Please do not write anything inside the above boxes!

Check that there are 3 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.

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Q-1) Discuss the convergence of the sum

$$\sum_{n=0}^{\infty} \binom{3n}{2n} x^n,$$

where $x \in \mathbb{R}$. Find the value of the sum in terms of x when the series converges.

Solution:

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Q-2) For each non-negative integer m , let

$$S_m = \sum_{n=1}^{\infty} \frac{1}{n^2 + m^2}.$$

Evaluate S_m .

Solution:

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Q-3) Let

$$I(n, \epsilon) = \int_{-i\infty}^{+i\infty} \frac{e^{\epsilon z}}{(z + \epsilon)^n},$$

where the integration is taken along the imaginary axis, n is a positive integer and $\epsilon \in \{-1, +1\}$.
Evaluate $I(n, \epsilon)$.

Solution: