Stony Brook University
Mathematics Department
Oleg Viro

Applied Complex Analysis
MAT 342
April 10, 2008

Midterm II

Examination time: 9:50-11:10 pm. No electronic devices, books or notes. Show all your work.

Name _____

Student ID # _____

Problem #	Points/total
1	/20
2	/20
3	/20
4	/20
Total	/80

Name _____

Problem 1 (20pt). Evaluate the integral

$$\int_C (\overline{z}^2 - z)\, dz,$$

where C is the segment of the unit circle from the point $(0, 1)$ to the point $(1, 0)$ taken in the counter clockwise direction.

Name _____

Problem 2 (20pt). Evaluate the integral

$$\oint_C \frac{f(z)}{(z-a)(z-b)}\,dz,$$

where f is an entire function, a, $b \in \mathbb{C}$ and $R > 0$ are given constants with $|a| < |b| < R$ and C is the circle $|z| = R$ taken in the counter clockwise direction.

Name _____

Problem 3 (20pt). Evaluate the integral

$$\oint_C \frac{1}{z^2} \cos \frac{\pi}{z+1}\, dz,$$

where C is the circle $|z| = 1/2$ taken in the counter clockwise direction.

Name _____

Problem 4 (20pt). Expand the function $f(z) = \dfrac{z}{z+2}$ in the Taylor series
a) about the point $z = 0$
b) about the point $z = 1$
and specify the radius of convergence for each series.