Math 185, Midterm 1

Section 1, 10-12am, N.Reshetikhin, July 9, 2009

Student's Name:

Student's i.d. number:

Problem	1	2	3	4	5	*Total*
Points	30	30	30	30	30	150
Grade						

1.*30 pnts* Is the function $f(z) = Im \cos z$ analytic? Justify your answer.

2.*30 pnts* Does the function $f(z) = Im(\ln(z))$ defined on the upper half plane have the limit as $z \to 0$ from the upper-half plane?

3.*30 pnts* Find the region of convergence of the series

$$\sum_{n=1}^{\infty} \sin(\pi \frac{n}{n+1}) z^n$$

4. *30 pnts* The function $f(z)$ is entire. Is the function

$$g(z) = \begin{cases} \frac{f(z)-f(0)}{z} & , \quad z \neq 0 \\ f'(0) & , \quad z = 0 \end{cases}$$

also entire?

5.*30 pnts* Compute the integral

$$\int_C \sin^2(x+iy)dz$$

where C is: