MAT 142
Quiz #10
April 28, 2005

Intructions: You have 15 minuntes for this quiz. You may not use any books, notes, or calculators. Justify every statement that you make. If you wish to use a theorem proved in class, state the theorem precisely. Good luck.

The natural logarithm has the following properties:

1. It is defined for all numbers except real numbers less than or equal to zero.
2. $\ln(ab) = \ln a + \ln b$.
3. $\ln x$ is the inverse of e^x.

Define the logarithm of a complex number so that is has the three properties listed above and agrees with the old logarithm for positive, real numbers. (Hint: It might be more convenient to work in polar coordinates.)