Math 312 Spring 2004

BONUS QUIZ 10A

Complex Analysis

Name: _____

Date: _____ **Friday April 9**
Time Begun: _____ Ron Buckmire
Time Ended: _____

Topic : Computing Residues and applying Cauchy Residue Theorems

The point of this bonus quiz is to provide you with another opportunity to demonstrate your facility with using Residues and applying the Cauchy Residue Theorems.

Reality Check:

EXPECTED SCORE : _____/10 ACTUAL SCORE : _____/10

Instructions:

0. Please look for a hint on this quiz posted to `blackboard.oxy.edu`
1. Once you open the quiz, you have **30 minutes** to complete, please record your start time and end time at the top of this sheet.
2. You may use the book or any of your class notes. You must work alone.
3. If you use your own paper, please staple it to the quiz before coming to class. If you don't have a stapler, buy one.
4. After completing the quiz, sign the pledge below stating on your honor that you have adhered to these rules.
5. Your solutions must have enough details such that an impartial observer can read your work and determine HOW you came up with your solution.
6. Rclax and cnjoy...
7. **This quiz is due on Monday, April 12**, in class. NO LATE QUIZZES WILL BE ACCEPTED.

Pledge: I, _____, pledge my honor as a human being and Occidental student, that I have followed all the rules above to the letter and in spirit.

Math 312 Spring 2004 **SHOW ALL YOUR WORK** **Bonus Quiz Ten**

1. 1998 Final Exam, Question 2. Consider $\oint_{|z-1|=4} z^n e^{1/z}\, dz$ where n is any integer. Derive a formula for the value of the contour integral involving n.

(a) *[3 points.]* Consider $n \geq 0$. Derive a formula which evaluates this integral. Explain the method you are using and why you chose this method.

(a) *[3 points.]* Consider $n < 0$. Derive a formula which evaluates this integral. Explain the method you are using and why you chose this method.

(c) *[2 points.]* In order to verify your previously-derived formula, write down the value of $\oint_{|z-1|=4} \frac{e^{1/z}}{z^4}\, dz$.

(d) *[2 points.]* In order to verify your previously-derived formula, write down the value of $\oint_{|z-1|=4} z^3 e^{1/z}\, d$