

Quiz 11

Complex Analysis

Name: _____

Date: _____

Time Begun: _____

Time Ended: _____

Friday April 16
Ron Buckmire

Topic : Applications of Contour Integration

The point of this quiz is to provide you with an opportunity to demonstrate your ability to use Contour Integration in an applied context.

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. Relax and enjoy...
7. **This quiz is due on Monday, April 19**, 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.

Fall 2001 Final Exam, Question 9. Evaluate $I = \int_0^{2\pi} \sin^4 \theta \, d\theta$ using contour integration.

(a) [5 points] Show that I can be written as the contour integral $\frac{1}{16i} \oint_{|z|=1} \frac{(z^2 - 1)^4}{z^5} dz$.

(b) [3 points] Show that the residue of $\frac{(z^2 - 1)^4}{z^5}$ at $z = 0$ is 6. (NOTE: $(a + b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4a^2b^3 + b^4$.)

(c) [2 points] Compute the value of I .