

Quiz 6

Complex Analysis

Name: _____

Friday February 27

Date: _____

Time Begun: _____

Ron Buckmire

Time Ended: _____

Topic : Complex Logarithm

The point of this quiz is to show your understanding of the Complex Logarithm function.

Reality Check:

EXPECTED SCORE : _____/10

ACTUAL SCORE : _____/10

Instructions:

0. Before you open the quiz, check out the hint at <http://blackboard.oxy.edu>.
1. Once you open the quiz, you have 40 minutes to complete it.
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, March 1**, 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.

- (a) (*4 points*) What is the image D' of the set $D = \{z : |z| \geq 1 \cap \pi/4 \leq \text{Arg}z \leq 3\pi/4\}$ under the mapping $w = \text{Log}(z)$? **Sketch the image and pre-image sets.** Remember to show the details of how you computed D' .
- (b) (*3 points*) Find all solutions of $e^{e^z} = 1$. **Indicate the location of the solution(s) z in a sketch of the complex plane.**
- (c) (*3 points*) Give an example of an integer n and complex number z_1 such that $\text{Log}(z_1)^n \neq n \text{Log}(z_1)$. Show that alternate sides of the expression are not equal for the numbers you select.