BONUS Quiz **2** Complex Analysis

Name: _____

ASSIGNED: **Friday March 4**
DUE: **Monday March 14**

Time Begun: _____
Time Ended: _____

Prof. Ron Buckmire

Topic : The Complex Logarithm

The **learning goal** of this bonus quiz is to provide an opportunity for students to demonstrate their understanding of the Complex Logarithm function.

Reality Check:

EXPECTED SCORE : _____**/5** ACTUAL SCORE : _____**/5**

Instructions:

1. Once you open the quiz, you have AT MOST **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. QUIZZES WITH UNSTAPLED SHEETS WILL NOT BE GRADED.
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. You should use full sentences wherever possible.
6. Relax and enjoy yourself.
7. **This quiz is due on Monday March 14**, in class. NO LATE OR UNSTAPLED 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.

SHOW ALL YOUR WORK & EXPLAIN EVERY ANSWER

1. (*3 points*) What is the image D' of the set $D = \{z \in \mathbb{C} : |z| \geq 1 \cap \pi/4 \leq \text{Arg}(z) \leq 3\pi/4\}$ under the mapping $w = \text{Log}(z)$? **Sketch the image and pre-image sets**. Remember to show the details of how you computed D' and write D' in set-builder notation.

2. (*1 point*) Find all solutions of $e^{e^z} = 1$. **Indicate the location of the solution(s) z in a sketch of the complex plane**.

3. (*1 point*) 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**.