

Quiz 10

Complex Analysis

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Time Begun: \_\_\_\_\_

Time Ended: \_\_\_\_\_

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Friday April 9

Ron Buckmire

**Topic :** Computing Residues and applying the Cauchy Residue Theorem

The point of this quiz is to provide you with an opportunity to demonstrate your facility with using Residues.

**Reality Check:**

EXPECTED SCORE : \_\_\_\_\_/10

ACTUAL SCORE : \_\_\_\_\_/10

**Instructions:**

0. Please look for a hint on this quiz posted to [blackboard.oxy.edu](http://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 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.

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1. Consider the function  $f(z) = \csc(z) = \frac{1}{\sin(z)}$

(a) (6 points) Show that the cosecant function  $\csc(z)$  has poles of order 1 at integer multiples of  $\pi$  with residue equal to  $\pm 1$  at each pole.

(b) (4 points) Use the above information to evaluate the integral  $\oint_C \csc(z) dz$  where  $C$  is the circle  $|z| = 4$  traversed **twice** in the **clockwise** direction.