

Quiz 11

DUE: FRI. APR. 25

Name: _____

Date: _____

Time Begun: _____

Time Ended: _____

Wednesday April 23

Ron Buckmire

Topic covered: Intervals of Convergence

The point of this quiz is for you to demonstrate your understanding and ability to evaluate improper integrals, using the Fundamental Theorem and also using Comparison Techniques.

Reality Check:

EXPECTED SCORE : _____/10

ACTUAL SCORE : _____/10

Instructions:

1. Once you open the quiz, you have 30 minutes to complete it. Before you open the quiz you should check Blackboard.oxy.edu for any hints.
2. You **may not** use the book or any of your class notes, but you may use a calculator. You must work alone.
3. If you use extra 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. Complete the reality check to give yourself a sense of how well you think you did on the quiz.
5. Relax and enjoy....
6. **This quiz is due on Friday, April 25**, at the beginning of 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.

EXPLAIN YOUR ANSWERS

Consider the Taylor Series for $\arctan(x) = \sum_{k=0}^{\infty} (-1)^k \frac{x^{2k+1}}{2k+1}$.

We want to find all the values of x for which the infinite series on the right converges exactly to the function value $\arctan(x)$. We do this by finding the radius of convergence and then checking the endpoints of the interval of convergence to see if the series converges at these endpoints.

(a) (*4 points*) Show that the Radius of Convergence of the Taylor Series is 1.

(b) (*3 points*) What is the value of the series when $x = 1$? Does the Taylor series converge or diverge at this x value?

(c) (*3 points*) What is the value of the series when $x = -1$? Does the Taylor series converge or diverge at this x value?

BONUS: (2 points) What is the interval of convergence of the Taylor Series for $\arctan(x)$?