Quiz 7

DUE: FRI. OCT. 25

Name: _____

Date: _____

Time Begun: _____

Time Ended: _____

Wednesday October 23

Ron Buckmire

Topic covered: Fundamental Theorem of Calculus

The idea behind the quiz is for you to illustrate your understanding of how to use numerical methods to evaluate a useful integral.

Reality Check:

EXPECTED SCORE : _____/10   ACTUAL SCORE : _____/10

Instructions:

1. Once you open the quiz, you have 30 minutes to complete it.

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 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. Relax and enjoy....

6. **This quiz is due on Friday, October 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.

SHOW ALL YOUR WORK

Two students are discussing different approaches to finding the value of $I = \int_1^2 e^{\sqrt{x}} dx$.

Devon: **Clearly there is no way to evaluate this integral.**

Lee: **But this is a definite integral, so we must be able to apply the Fundamental Theorem of Calculus to obtain a value for I (it's just a number).**

Devon: **Hmmm, well now that you mention that it's a definite integral I remembered that we can estimate any definite integral using Riemann sums like Simpson's Rule.**

Lee: **Why bother? We can use integration by substitution if we let $u = \sqrt{x}$ to rewrite the given integral as $\int_1^{\sqrt{2}} 2ue^u du$ and then integrate by parts, substitute back to obtain the anti-derivative $F(x) = 2e^{\sqrt{x}}(\sqrt{x} - 1)$ which we then use to find an approximate value of I equal to $F(2) - F(1)$.**

Devon: **Well, you have to do all that work to get an approximate answer and I can just plug some symbols into a TruBasic program, set $N = 1000000$ and also get a really really accurate estimate, so I think my way is better!**

[1.] (*10 points*) Write **at least 5 sentences** discussing the students' understanding of The Fundamental Theorem of Calculus. Identify **any** and all correct, incorrect or partly correct statements made by the students. If a statement is incorrect explain why. **You must be careful not to make any incorrect statements yourself in your explanation.** PROOFREAD YOUR ANSWER.