

Quiz 1

Name: _____

Date: _____

Time Begun: _____

Time Ended: _____

Friday, September 5, 2003

Ron Buckmire

Topic covered: Initial Value Problems and Euler's Method

The idea behind the quiz is for you to illustrate your understanding of solutions of initial value problems and your ability to approximate these functions at particular values.

Reality Check

EXPECTED SCORE: _____/10

ACTUAL SCORE: _____/

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 Monday, September 8**, 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

Consider the initial value problem (IVP)

$$y' = k(y - b), \quad y(0) = A$$

1. [4 points] Show that the exact solution to the IVP is $y(t) = b + (A - b)e^{kt}$.

2. **(a)** [4 points] If $A = 15, b = 2, k = -.04$ use Euler's Method with $\Delta t = 1$ to estimate the value of $y(1)$.

(b) [2 points] Compare the exact value of $y(1)$ to the approximate value obtained in **2 (a)**. Which do you *expect* to be bigger and how well does reality match your expectation?