# Math 110 Fall 2000

## Quiz **2** — Basic Calculus I

Name: _____

Date: _____
Time Begun: _____
Time Ended: _____

Math 110
**Wednesday, September 13, 2000**
Ron Buckmire
Alan Knoerr

## **Topic covered:** Euler's Method and Piecewise Linear Functions

The idea behind this quiz is to assess your ability to use Euler's Method to find an approximate solution to an initial value problem. The quiz is also an opportunity for you to indicate your understanding of piecewise linear functions.

## 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. 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. This quiz is due on Friday, September 15, 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) below

$$\begin{aligned} C'(t) &= 2t \cdot (C(t))^2 \\ C(1) &= -1. \end{aligned}$$

(a) (6 points) Use Euler's method with a time step of $\Delta t = 1$ to fill in the table below.

| $t$ | $C(t)$ | $\Delta t$ | $C'(t)$ | $\Delta C$ |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | XXXXXXXX<br>XXXXXXXX<br>XXXXXXXX | XXXXXXXX<br>XXXXXXXX<br>XXXXXXXX |

(b) (4 points) Plot below the piecewise linear approximation to $C(t)$ you have just computed in part (a) using Euler's Method.