Quiz **10**   Basic Calculus I

Name: _____

Date: _____

Time Begun: _____

Time Ended: _____

Occidental College
Monday, November 19, 2007
Prof. Ron Buckmire

Topic covered: Single Variable Optimization

The idea behind this quiz is to give you the opportunity to practice your mathematical modeling, differentiation and problem solving skills.

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, any of your class notes. You may use a graphing calculator. You must work alone and not communicate with any student any information about your answers or the quiz itself.

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 in class on Monday, November 26**, 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 AND EXPLAIN ALL YOUR ANSWERS

1. Find the two positive numbers x and y which satisfy the given requirements:

   ☐ The product of the two numbers is **192**.

   ☐ The sum of the two numbers is a **minimum**.

   a. (*1 point*) Write down an equation relating x and y using the information above.

   b. (*2 points*) Write an equation for S, the sum of the two numbers, that only has ONE VARIABLE (x or y) in it.

   c. (*4 points*) Find the values of x and y which minimize S

   d. (*2 points*) Check that the values of x and y which minimze S actually produce the smallest value S can be.

   e. (*1 point*) What is the minimum value of the sum S for two numbers whose product is 192?