

Quiz 1

EXPERIENCED CALCULUS I

Name: _____

Date: _____

Time Begun: _____

Time Ended: _____

Math 114

Friday, September 2, 2005

Ron Buckmire

Angela Gallegos

Topic: Functions

This quiz is intended to illuminate your understanding of functions and their applications.

Instructions:

1. Once you open the quiz, **you have 30 minutes to complete it.**
2. You may not use your text or any other source, including course materials. You may use a calculator. You must work alone. Do not discuss the contents of this quiz with anyone.
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 or borrow one. **UNSTAPLED PAPERS WILL NOT BE GRADED.**
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 Wednesday, September 7**, 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

1. (5 points). **Smith & Minton, Page 24, # 96.** A **linear transformation** is defined as any function f satisfying $f(a + b) = f(a) + f(b)$ and $f(cx) = cf(x)$, where a, b and c are unknown parameters. Show that, according to this definition $f(x) = 3x + 2$ is NOT a linear transformation, but $f(x) = 3x$ is. ($f(x) = 3x + 2$ is known as an **affine transformation**.)

2. (5 points). **Hughes-Hallett, Page 6, # 7.** In her *Guide to Excruciatingly Correct Behavior*, Miss Manners states:

There are three possible parts of a date of which at least two must be offered: entertainment, food and affection. It is customary to begin a series of date with a great deal of entertainment, a moderate amount of food and the merest suggestion of affection. As the amount of affection increases, the entertainment can be reduced proportionately. When the affection has replaced the entertainment, we no longer call it dating. Under no circumstances can the food be omitted.

Based on this statement, sketch a graph showing entertainment as a function of affection, assuming the amount of food to be constant. **Mark the point** on the graph at which the relationship starts, **AND the point** at which the relationship ceases to be called dating. **For full credit, write 3 complete sentences** explaining the relationship between the features of your graph and the function described above by Miss Manners.