Math 370 Fall 98

Quiz 2

Numerical Analysis

Name: _____

Date: _____ Wednesday September 9
Time Begun: _____ Ron Buckmire
Time Ended: _____

Topic: Implications of Floating Point Arithmetic

The idea behind this quiz is for you to indicate your understanding of how round-off error due to finite-precision arithmetic crops up in actual computations

Instructions:

1. Once you open the quiz, you have as much time as you need to complete it, but record your start time and end time at the top of this sheet.
2. You may use the book or any of your class notes. 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. Relax and enjoy...
7. This quiz is due on Monday September 14, in 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.

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1. This problem is #17 on page 28 of Burden & Faires. Suppose two points (x_0, y_0) and (x_1, y_1) are on a straight line with $y_1 \neq y_0$. Two formulas are available to find the x-intercept of the line:

$$x_A = \frac{x_0 y_1 - x_1 y_0}{y_1 - y_0} \qquad \text{and} \qquad x_B = x_0 - \frac{(x_1 - x_0) y_0}{(y_1 - y_0)}$$

a. Show that both formulas are algebraically correct.

b. Use the data $(x_0, y_0) = (1.31, 3.24)$ and $(x_1, y_1) = (1.93, 4.76)$ and three-digit rounding arithmetic to compute the x-intercept both ways.

c. Which method is better (formula A or formula B), and why?