

AMSC/CMSC 460 Quiz 1 , Fall 2001

Show all work. You may leave arithmetic expressions in any form that a calculator could evaluate. By putting your name on this paper, you agree to abide by the university's code of academic integrity in completing the quiz. Use no books, calculators, cellphones, communication with others, scratchpaper, etc.

Name \_\_\_\_\_

Student number \_\_\_\_\_

For this page of the quiz, assume you have a base 2 computer that stores floating point numbers using a 5 bit normalized mantissa (x.xxxx), a 4 bit exponent, and a sign for each. Assume that all numbers are chopped rather than rounded.

1a. ( 5) Give the machine representation and a base 10 representation for the smallest nonzero positive number.

1b. ( 5) What range of real numbers has the same representation as 16.625 if numbers are converted to binary, chopped, and then stored?

2. (5) What is the relative error in 2.14 as an approximation to 2.14836?

3. (5) Define backward error analysis.