

AMSC/CMSC 660 Quiz 5 , Fall 2003

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 _____

1a. (5) Suppose we have a QR decomposition of a matrix A of dimension $m \times n$ and then we add a row to A . How many Givens rotations does it take to form the QR decomposition of the new matrix?

1b (5) Suppose we have an SVD of a nonsingular matrix A of dimension $n \times n$: $A = U\Sigma V^T$. Given the SVD, how many multiplications would it take to solve the linear system $Ax = b$? (In your answer, make clear how you would use the factors to solve the problem.)

2. (10) Write code to estimate the area of the circle centered at $(0,0)$ of radius 4 by Monte-Carlo integration.