M561 Problem Set Number 4

1. Let A be an $m \times n$ matrix with full rank. Determine the exact number of floating point additions, subtractions, multiplications, divisions *and* square-roots involved in determining the QR factorization via algorithm 7.1. What is the asymptotic flop count? Provide a geometric interpretation similar to the one provided in Lecture 8 for the modified GS algorithm.

2. Problem 8.2. You may adapt the Matlab code for the classical Gram-Schmidt available on the course homepage. Assume that A has full rank.

3. Use your program from Problem 8.2 to reproduce Figure 9.1 in the text. See the Matlab code on the course homepage for plotting instructions.

4. Problem 9.3.