MATH 581 **Numerical Methods for Linear Systems** **Fall 2011**

Homework 1

Due: Wed. Sept. 21, 2011

Lecture 1, pg. 9: 1.1, 1.3
Lecture 2, pg. 16: 2.1, 2.5, 2.6
Lecture 3, pg. 24: 3.2, 3.3, 3.5
Lecture 4, pg. 31: 4.1, 4.3

Additional Problem

1. Let A be an orthogonal matrix (i.e., its entries are real and $A^{-1} = A^{\top}$). Prove:

(a) $|\det(\mathrm{A})| = 1$

(b) If B is also orthogonal and $\det(A) = -\det(B)$, then $A + B$ is singular.