Stat 521 HW2 **Fall 2012** **Due September 14, 2012**

Required Part:

0. Read §1b Theory of Matrices and Determinants.

1. Exercise 1.2 (c) on page 30.

2. Let A be an $m \times n$ ($m \geq n$) matrix with rank n. Let $A = QR$ be a QR decomposition of A, that is, Q is an $m \times n$ suborthogonal matrix and R is an $n \times n$ upper triangular matrix. Show that if the diagonal elements of R are required to be non-negative, then the QR decomposition is unique.

3. Let A and B be $m \times n$ matrices. Show that $R(A + B) \leq R(A) + R(B)$.

4. Exercise 2.7 on page 33.

5. Exercise 7 on page 34.

Optional Part (no need to hand in):

6. Exercise 1.6 on page 31.