

STAT 611

FALL 2011

HWS

DUE THURSDAY, OCTOBER 20

1. SUPPOSE $X = [X_1, X_2]$ IS FULL-COLUMN RANK. SUPPOSE $X_1'X_2 \neq 0$.

a) PROVE THAT $X_2'(I - P_{X_1})X_2$ IS A SYMMETRIC POSITIVE DEFINITE MATRIX.

b) PROVE THAT

$$(X_1'X_1)^{-1}X_1'X_2(X_2'(I - P_{X_1})X_2)^{-1}X_2'X_1(X_1'X_1)^{-1}$$

IS NONNEGATIVE DEFINITE.

2. COMPLETE THE FOLLOWING PROBLEMS

FROM THE TEXT. 3.26, 4.1, 4.2, 4.11, 4.12.