Math 502 Problem Set #2 Due week of Sept. 18, 2006, in lab.

Read Artin, Chapter 1, sections 3-5.

From Artin, do these problems:

Section 1.2 (pp.33-34): 13, 14. [You might want to do #14 first.]
Section 1.3 (pp.34-35): 1(c,e), 5, 8.
Section 1.4 (pp.35): 2, 4.
Section 1.5 (pp.36): 2 (just the second matrix), 3.

Also do the following problems:

1. Let $A = \begin{pmatrix} 1 & 1 & 1 \\ 1 & -1 & 0 \\ 0 & 1 & c \end{pmatrix}$, where c is a real number.

a) Find A^{-1} using row reduction.

b) *Using* part (a), determine for which real numbers c there is no inverse for A.

c) Compute the determinant of A.

d) *Using* part (c), determine for which real numbers c there is no inverse for A. Verify that this agrees with your answer to (b).

2. Let A be a 3×2 matrix and let B be a 2×3 matrix.

a) Find the determinant of AB. [Hint: What is the row echelon form of A? of AB?]

b) What can you say, if anything, about the determinant of BA?