

## Homework 2, Summer 2006

1. Prove that if the system

$$a_{1,1}x_1 + a_{1,2}x_2 = b_1$$

$$a_{2,1}x_1 + a_{2,2}x_2 = b_2$$

is such that

$$a_{1,1}a_{2,2} - a_{1,2}a_{2,1} \neq 0$$

then it has a unique solution.

2. Consider the system

$$a_{1,1}x_1 + a_{1,2}x_2 = b_1$$

$$a_{2,1}x_1 + a_{2,2}x_2 = b_2$$

Prove that if the system

$$a_{1,1}x_1 + a_{1,2}x_2 = b_1$$

$$\beta_{2,1}x_1 + \beta_{2,2}x_2 = c_2$$

is obtained from the original system by multiplying the first equation by the real number  $\gamma$  and adding the result to the second equation, then the two systems are equivalent (that is, their solution sets are equal).

Do all five problems from Section 1.1 in the textbook.