Math 211.01 Homework 1

Due Wednesday January 25, 2006, at the beginning of class

This homework is based on Sec 1.1 of Bretscher. Explain your work clearly and write neatly! (But pencil is fine.) Put your name on the paper and please staple the pages together.

Problem 1. Find all solutions to the linear system:

$$\left|\begin{array}{rcr} x+3y+2z & = & 8 \\ x+3y+3z & = & 10 \\ x+4y+2z & = & 9 \end{array}\right|$$

Problem 2. Find all solutions to the linear system below. Represent the solution graphically as the intersection of two (carefully drawn) lines in the x, y plane.

$$\left|\begin{array}{rcr} x+2y & = & 3 \\ x-3y & = & 1 \end{array}\right|$$

Problem 3. Consider the following linear system that depends on a real number k:

$$\left|\begin{array}{rcr} x+2y+3z & = & 1 \\ 3x+2y+z & = & 1 \\ 2x+2y+kz & = & 1 \end{array}\right|$$

(a) For which value(s) of k does this system have a unique solution? Give this solution in terms of k.

(b) For which value(s) of k does this system have infinitely many solutions? Find all these solutions.

(c) Are there any values of k for which there are no solutions?

Problem 4. Find the polynomial of degree 2 (so of the form $f(t) = at^2 + bt + c$) whose graph goes through the points $(1, 2)$, $(-1, 4)$ and $(2, 4)$.

Problem 5. You have 22 bills, a mixture of \$1s, \$5s and \$10s, in your pocket worth a total of \$100. How many do you have of each? There are two possible solutions. Find both.