



Name: \_\_\_\_\_

Math 130 Linear Algebra  
Quiz  
10 Sep 2009

**Problem 1.** Display a system of 3 linear equations in 3 unknowns that has no solutions.  
(You don't have to try to solve the system; just write the three equations.)

**Problem 2.** A square matrix  $A$  is said to be *symmetric* if it equals its own transpose, that is,  $A^T = A$ . In other words, for all indices  $i$  and  $j$ ,  $a_{ij} = a_{ji}$ . For example,

$$\begin{bmatrix} 3 & 0 & 5 \\ 0 & 2 & 7 \\ 5 & 7 & -2 \end{bmatrix}$$

is a  $3 \times 3$  symmetric matrix. Give an example where the product of symmetric matrices does not commute. That is, display two symmetric matrices  $A$  and  $B$ , and compute both products,  $AB$  and  $BA$ , which should not be equal. (Hint:  $2 \times 2$  matrices are large enough.)