Linear Algebra, Hints on HW 2
5/9/02

If you get stuck, you can email me, or visit the reserve room of the library and ask for the student guide. Since today's lecture was rushed, I'm posting these comments, too:

1.3-13a) If you can't do this by trial and error, you might try doing b) before doing a)!

1.3 - 20 Look at a few simple 2x2 examples with 3 out of 4 entries equal to zero until you get $AB = O$.

1.3 - 21 You can relate this to 1.3 - 20.

1.3 - 25 Use logic to organize this. Part One is - Assume that A and B are symmetric and that $AB = BA$. The goal is to show that $(AB)^T = AB$. Start with the left side and "simplify it". You will need Rule 4 on page 56, and the 3 hypotheses above to do that. Then decide what Part Two requires, and do it.

1.4-6 I didn't get to LU, so read over pages 74-75, and then
a) Use 3 GE steps to clean up a_{21}, a_{31} and a_{32} and call the result U. Find the 3 E's that go with your 3 operations.
b) The inverses of E's are pretty easy to just reason out (see Thm 1.4.2 and exs on page 75), but if confused, you can use the method on page 73 instead.
I'll plan to cover this more on Monday.

1.4-9 Like ex 4, page 73.

1.4-11. This is like 7th grade algebra, where you are supposed to "solve for x", adding to both sides, etc. Except the numbers are now matrices, which means you can't divide and you must be careful (because $AB \neq BA$ etc). In part a), start with $AX = C - B$, then multiply by A^{-1} on *the left* of both sides to get $X =$ something. You'll have to compute A^{-1} and do a little more work to get the final answer.

1.4-15. Assume B is singular. Use the textbook hint to show that $B\mathbf{x} = \mathbf{0}$ has a nontrivial solution. What does this say about the system $AB\mathbf{x} = \mathbf{0}$? What does this say about AB?

1.4.21 a) Idea: If you can get from Miami to Brazil by car and from Brazil to Argentina by car, then ? But make this precise by using the definition on pg 71 (use it 3 times actually!).
b) Which simple matrix is every nonsingular matrix row equivalent to (see thm 1.4.3)?