

HOMEWORK 7
DUE WEDNESDAY, 5 MARCH 2008

MATH 215 - LINEAR ALGEBRA - TOM LAGATTA

- Read pages 152-176 in the textbook (Sections 3.2 and 3.3). These will be the sections the exam covers!
- **Section 3.1:** 1, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 29, 31, 35, 39, 40, 41
- Notes:
 - For problem 35, give a proof if you're comfortable with mathematical induction. Otherwise, you may just explain without proof.
- **MATLAB:**
 - Input the matrices

$$A = [-3, 4, 0; 1, -1, 5]$$

and

$$B = [1, 2, 3; 4, 5, 6; 7, 8, 9].$$

Try to compute $A * B$ and $B * A$. One of these multiplications does not work; why not?

- Find the transpose of A by typing A' (i.e. A followed by an apostrophe). Compute $C = A * A'$ and $D = A' * A$. Notice that these are not the same matrix! They are both symmetric, though.
- Compute $B * D$ and $D * B$. Notice that matrix multiplication is *not* commutative.
- Try to take the matrix powers A^2 and B^2 . Notice that you can't square A because it's not square.¹ Compute B^3 and B^4 .
- Compute B^0 and B^{-1} , then compute $B * B^{-1}$. What is the significance of the matrix B^{-1} ?

Date: Spring 2008.

¹Notice too my clever use of "square" as both a verb and an adjective.