Math 4326 **LINEAR ALGEBRA** Spring 2015
Dr. Duval **Homework**
Monday, February 23

Follow the separate general guidelines for Parts A,B,C. Be sure to include and label *all four* standard parts (a), (b), (c), (d) of Part A in what you hand in.

Matrices (part II): Matrix Multiplication

Section 3.C, pp. 74–78

A: Reading questions. Due by 2pm, Sun., 1 Mar.

1. In the long string of equalities in the middle of p. 74, what are u_k, v_r, and w_j?
2. Why is matrix multiplication defined the way it is? What equation are we trying to make hold by defining it this way? [Hint: The answer is stated very explicitly and precisely in the text, in a single sentence.]
3. Why does Notation 3.44 make sense? (Unless you think it doesn't make sense, in which case you should explain why you think that.)
4. Verify result 3.49.

B: Warmup exercises. For you to present in class. Due by the end of class Mon., 2 Mar.

Exercises 3.C: 9, 12

Invertibility and Isomorphism

Section 3.D

This is a longer section. For now, you only have to read carefully pp. 80–82, 84.

A: Reading questions. Due by 2pm, Tue., 3 Mar.

1. How many inverses can a linear transformation have?
2. When, if ever, in the proof of result 3.56 do we use the linearity of T or of any other map?
3. In the first half of the proof of result 3.59, it is claimed, "Because T is invertible, we have $\operatorname{null} T = \{0\}$ and $\operatorname{range} T = W$." Why is this implication true?
4. Why define $\mathcal{M}(v)$ as it is defined in Definition 3.62, as opposed to the more simple definition given for $\mathcal{M}(x)$ in Example 3.63?

B: Warmup exercises. For you to present in class. Due by end of class Wed., 4 Mar.

Exercises 3.D: 1