Math 4326/5322 **LINEAR ALGEBRA** Spring 2019
Dr. Duval **Homework**
Wednesday, January 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.

$\mathbf{R}^n$ and $\mathbf{C}^n$
Section 1.A

A: Reading questions. Due by 2pm, Sun., 27 Jan.

1. Verify, using properties of real numbers, and that $(-i)^2 = -1$, that complex numbers satisfy the distributive property.
2. What does $\mathbf{F}$ stand for?
3. What two things does 0 stand for? Why do we use this same symbol for both of these things?
4. The picture for addition in $\mathbf{F}^n$ on p. 9 is 2-dimensional ($n = 2$), since it is drawn on a 2-dimensional piece of paper. Does this picture work for larger values of n? Why or why not?
5. What gets multiplied in scalar multiplication?

B: Warmup exercises. For you to present in class. Due by the end of class Mon., 28 Jan.

Exercises 1.A: 2, 10, 15

Definition of Vector Space
Section 1.B

A: Reading questions. Due by 2pm, Tue., 29 Jan.

1. Verify commutativity in $\mathbf{F}^\infty$.
2. Verify distributivity in $\mathbf{F}^S$.
3. In the proof of result 1.26 (Unique additive inverse), why do we "[s]uppose that w and w' are additive inverses of v"?
4. In result 1.30 (A number times the vector 0), identify which properties of vector spaces are used at each step of the proof.
5. Result 1.31 (The number -1 times a vector) may seem unnecessary to prove. But $(-1)v$ and $-v$ are **defined** differently, if you look carefully at the definitions. How is each one defined?

B: Warmup exercises. For you to present in class. Due by end of class Wed., 30 Jan.

Exercises 1.B: 1, 3, 4