Math 4326   **LINEAR ALGEBRA**   Spring 2017
Dr. Duval   **Homework**
                            Thursday, January 19
   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.

Definition of Vector Space
Section 1.B

A: Reading questions. Due by 2pm, Mon., 23 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 Tue., 24 Jan.

   Exercises 1.B: 1, 3, 4

Subspaces
Section 1.C

A: Reading questions. Due by 2pm, Wed., 25 Jan.

1. Verify Example 1.35 parts (a) and (d).

2. Verify Example 1.37.

3. Fill in the details of the first paragraph of the proof of results 1.39 (Sum of subspaces is the smallest containing subspace).

4. Does $U + W$ exist for *any* pair of subspaces U and W? Does $U \oplus W$ exist for *any* pair of subspaces U and W? Justify your answer in each case.

5. Verify Example 1.41.

6. In the proof of result 1.44 (Condition for a direct sum), where do we use the assumption that the U_i's are subspaces? [Note: This may be at just one point in the proof, or at more than one point.]

B: Warmup exercises. For you to present in class. Due by the end of class Thu., 26 Jan.

   Exercises 1.C: 1, 3, 15