Math 4326 **LINEAR ALGEBRA** Spring 2017
Dr. Duval **Homework**
Tuesday, February 28

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.

Polynomials

Chapter 4

Note the first two paragraphs of the chapter on p. 117. Indeed, you are not responsible for any of the *proofs* in this chapter, but you should become familiar with the *statements* of all the results.

A: Reading questions. Due by 2pm, Mon., 6 Mar.

1. Pick a polynomial of degree 3. Demonstrate result 4.11 (Each zero of a polynomial...) on your polynomial. That is, find a root λ (be sure to demonstrate it's a root), and the corresponding polynomial $q(z)$. [Hint: Plan ahead! Pick a polynomial that will make your job easier.]
2. Pick an $m \geq 4$. Find a polynomial p with degree m such that p has less than m distinct roots.
3. Why does result 4.14 (Factorization of a polynomial over $\mathbf{C}$) have to include the phrase "(except for the order of the factors)"?
4. Why might your answer to question 2 above *seem* to contradict result 4.14? Why doesn't it *actually* give a contradiction?
5. Describe as clearly as you can the differences between factorization in $\mathcal{P}(\mathbf{C})$ and factorization in $\mathcal{P}(\mathbf{R})$. [Hint: Focus on result 4.14.]

B: Warmup exercises. For you to present in class. Due by the end of class Tue., 7 Mar.

Exercises Ch. 4: 1, 4, 7