Math 5370   **ALGEBRAIC STRUCTURES**   Fall 2016
Dr. Duval   **Homework**
Thursday, September 15

Written homework. Due in writing, at the beginning of class,

> **Thursday, September 22.** 2.29, 2.30, 2.50, 3.6, 3.14. (For 3.14, do *not* use the quadratic formula, as proving the quadratic formula is one of the goals of the problem. Instead use the ideas from Exercises 2.29 and 3.15.)

Warmup exercises. To present in class

> **Tuesday, September 20.** 3.5, 3.15.

> **Thursday, September 22.** 3.25, 3.46.

Reading assignment. Read sections 3.3 through 3.4 (but you can save the subsection at the end of 3.4, on roots of unity, until next week), and be ready to answer the following reading questions.

1. Pick three complex numbers, u, w, z. Illustrate each of Propositions 3.9, 3.10, and 3.11 with your complex numbers. (This should be prepared in writing in order to share with the rest of the class on the document camera.)

2. Draw a diagram illustrating Proposition 3.13(ii)

3. Describe in your own words (perhaps we should say "wording you could use with interested high school students") what Theorem 3.18 is saying. In order to do this well, I think you will have to read and understand the discussion leading up to the statement of the theorem in the subsection "The Geometry Behind Multiplication".

4. Illustrate the statement of Theorem 3.20 by picking a "good" example of n and θ, and then drawing on the complex plane $(\cos\theta + i\sin\theta)^k$ for $k = 1, \ldots, n$.