Due: Friday, February 3, 2017 at noon.

All numbered problems are from Dummit and Foote, Third Ed.
All problems will be graded. Show all work to receive full credit.

Read sections: 9.1 thru 9.5 of the textbook.

- From section 8.3: problems 3, 6.
- From section 9.4: problems 11, 13.
- Let $\mathbb{R}[x]$ the ring of polynomials in one variable with real coefficients. Prove that up to multiplication by a non-zero constant all irreducibles of $\mathbb{R}[x]$ are either linear of the forms $x - a$ or quadratic of the form $x^2 + bx + c$ with $4c - b^2 > 0$. Deduce that every odd degree polynomial has a root in $\mathbb{R}$.
- From section 9.5: problems 1, 3.

The following problem is for extra credit:

- From section 9.3: Problem 4, and part (e) of Problem 5 (where you may assume parts (a) through (d)).