Math 113 Homework #10, due 11/25/9 at 2:10 PM

1. Let R be an integral domain and $f \in R[x]$ a nonzero polynomial. Prove that if $\alpha \in R$ is a zero of f, then there is a unique $g \in R[x]$ such that $f = (x - \alpha)g$. (That is, the Factor Theorem is true for $R[x]$ when R is an integral domain, even though the Division Theorem is not.) *Hint:* use induction on the degree of f.

2. Fraleigh chapter 27 problems 6, 14, 15, 16.

3. Fraleigh chapter 45 problem 10.

4. Fraleigh chapter 46 problems 12, 13.

5. Fraleigh chapter 47 problems 4, 5, 6, 7, 8.