HW #1, due 4-4

Math 506A

1. Let R be a commutative ring. Show that a polynomial $p \in R[x]$ is a zero divisor in $R[x]$ if and only if there is a nonzero constant $b \in R$ with $bp = 0$. Generalize this to polynomials in several variables.

2. Show that the sum of a unit and a nilpotent element in a commutative ring is a unit. Use this to show for a commutative ring R that $p \in R[x]$ is a unit if and only if its constant term is a unit in R and the other coefficients are nilpotent.

3. Exercise 15.1.2, p. 668.

4. Exercise 15.1.5.

5. Exercise 15.1.6.

Read 15.1,2.