This homework is due on Wednesday, February 19.

These problems can be turned in by hand:

Section 9.1: 4, 5
Section 9.2: 1, 5
Section 10.1: 1, 2, 8a
Section 10.2: 4, 5

This problem must be typed up:

1. Let F and K be finite fields with $F \subseteq K$. Let $F[x]$ and $K[x]$ denote the respective polynomial rings in the variable x, so $F[x]$ is a subring of $K[x]$.

    (a) Prove that if M is any maximal ideal in $K[x]$, then $M \cap F[x]$ is a maximal ideal in $F[x]$.

    (b) Give an explicit example of commutative rings $A \subseteq B$ and a maximal ideal I of B such that $I \cap A$ is not a maximal ideal of A.