

Math 81. *Abstract Algebra*.

Homework 5. Due on Wednesday, 2/18/2009.

1. Let K/F be an algebraic field extension.
 - (a) Suppose that $\sigma : K \rightarrow K$ is an injective ring homomorphism that fixes F point-wise. Show that σ is an automorphism of K .
 - (b) Suppose that K has the property that any irreducible polynomial in $F[x]$ having one root in K splits in K . Let \overline{F} be an algebraic closure of F and show that any injective ring homomorphism $\sigma : K \rightarrow \overline{F}$ which fixes F is an automorphism of K .
2. Page 567, problem 6.
3. Page 567, problem 7.