Mathematics 552 **Algebra II** **Spring 2017**

Week 10 Galois Theory
Jacobson I: 4.5

1. Jacobson I 4.5.2
2. Jacobson I 4.5.3
3. Jacobson I 4.5.6
4. Jacobson I 4.5.9
5. Suppose that E is a subfield of the complex numbers which is mapped to itself by complex conjugation. Show that the set E_0 of real numbers in E is a subfield of E and $[E : E_0] \leq 2$. If $E/\mathbf{Q}$ is Galois, show that $E_0/\mathbf{Q}$ is Galois if and only if $Gal(E/E_0)$ is in the center of $Gal(E/\mathbf{Q})$.
6. Jacobson I 4.5.13