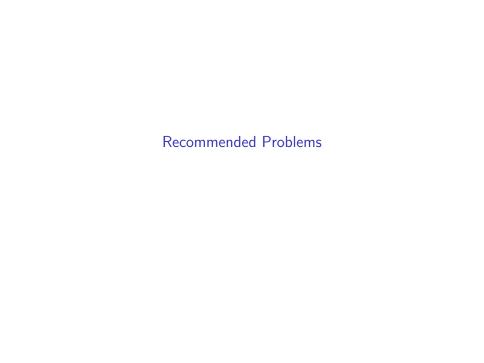
Recommended Problems



Recommended Problems

- 1. (DF, 14.2, problem 14) Show that $\mathbb{Q}(\sqrt{2+\sqrt{2}})$ is an extension of degree 4 with cyclic Galois group.
- 2. (DF, 14.2, Problem 16) Show that x^4-2x^2-2 is irreducible and that its roots are $\pm\sqrt{1\pm\sqrt{3}}$. Let $\alpha_1=\sqrt{1+\sqrt{3}}$ and $\alpha_2=\sqrt{1-\sqrt{3}}$. Show that $K_1=\mathbb{Q}(\alpha_1)$ and $K_2\mathbb{Q}(\alpha_2)$ are different, and that their intersection is the field $F=\mathbb{Q}(\sqrt{3})$. Then show that K_1K_2 has Galois group $\mathbb{Z}/2\mathbb{Z}\times\mathbb{Z}/2\mathbb{Z}$ over F. Finally show that x^4-2x^2-2 has galois group equal to the Dihedral group of the square.
- 3. (DF, 14.2, Problem 17-18) These problems derive some basic properties of the galois norm and trace for an algebraic element defined as: