Galois Theory: GAL #07

Due on Apr 08, 2022 at 11:59pm

Prof Matyas Domokos Section 11

Xianzhi

2023

HW07
Apr 08, 2022
Exercise 11.4.2
Exercise 11.4.6
Exercise 11.4.8

Problem 1

Exercise 11.4.2 Show that $f \in K[X]$ (where K is a subfield of $\mathbb{C}$) has a root in a radical extension of K $\iff$ f has an irreducible factor p in $K[X]$ such that $Gal_K(p)$ is solvable.

Soln:

Problem 2

Exercise 11.4.6 Suppose that $L : K$ and $M : L$ are normal extensions. Does it follow that $M : K$ is a normal extension?

Soln:

Problem 3

Exercise 11.4.8 Find a degree 6 irreducible polynomial $f \in \mathbb{Q}[X]$ whose Galois group is isomorphic to S_3.
Soln: