

Exercises for week 9

Problem 1. Show that \mathbb{Z}_p is not algebraically closed for any p prime.

Problem 2. Let \mathbb{F} be a field. Show that the field of fractions of $\mathbb{F}[x]$ is not algebraically closed.

Problem 3. What is the algebraic closure of \mathbb{C} ?

Problem 4. Compute the Galois group of $\mathbb{Q}(\sqrt{p})$ over \mathbb{Q} .

Problem 5. Compute the Galois group of \mathbb{F} over \mathbb{Q} where \mathbb{F} is the splitting field of $x^3 - 2$ over \mathbb{Q} .