

Homework 5

(due Friday Feb 12, 2016)

February 9, 2016

1 Problem 1

Prove that if $p^j \geq [K : \mathbf{Q}]$ then $I_p/pI_p \subset S/pS$ is the kernel of $x \mapsto x^{p^j}$.

[[If you can't figure it out, the proof is in Cohen's book (page 303). I'm fine if you read the proof, understand it, and write it down here in your own words. It's pretty short. I even scanned the relevant part of Cohen's book in and put it in the directory for the lecture for Feb 5.]]

2 Problem 2

Prove that for any number field $K \neq \mathbf{Q}$ there is an order S in K so that we have to run the round 2 algorithm at least 100 times in order for it to terminate.