

Math 105
Homework 5

1. (4-1-x) For each rational prime $p \geq 2$, characterize all quadratic extensions K of \mathbb{Q}_p .
2. (4-1-x) Let K, L be local fields containing \mathbb{Q}_p , $\varphi : K \rightarrow L$ an algebraic isomorphism with $\varphi|_{\mathbb{Q}_p} = id$. Show that φ is continuous and open.
3. (4-1-x) Let E/F be an extension of local fields. Say that $\alpha \in E$ is integral over F if it is the root of a monic irreducible polynomial in $\mathcal{O}_F[x]$. Show that \mathcal{O}_E equals the set of elements of E integral over F .