

MATH 748: HOMEWORK 12

- (1) Milne 7-3, and for one (non-trivial) of these a use sage to find an approximation of a solution X up to 7^{25} (give your answer as the first terms of a standard Laurent series in 7).
- (2) Milne 7-4 (in part (a) you may omit $p = 2$)
- (3) For each place v of \mathbb{Q} , for what a is $|\cdot|_v^a$ an absolute value? (where $|\cdot|_v$ denotes the normalized one.)
- (4) Prove what we said in class: for a non-archimedean $|\cdot|$ on a field K , if $|a| < |b|$, then $|a + b| = |b|$.
- (5) At the end of the proof of Milne Prop 7.6, we said if $|\cdot|$ was a nonarchimedean absolute value on K , with associated maximal ideal (π) , then $|K|^* = |\pi|^{\mathbb{Z}}$. Give an argument for this.