Homework exercises for lecture #6

TO BE HANDED IN ON MARCH 9.

1. (From Lenstra) Let K be a field of positive characteristic, $K[t]$ the polynomial ring, and let $f \in K[t] - \{0\}$ have degree not divisible by p. Prove that $X = \operatorname{Spec} K[t]$ is unramified in the p-th degree extension $K(t,u)$ of $K(t)$ defined by $u^p - u = f$. Deduce that the natural map $\pi(\mathbb{A}^1_K) \to \pi(\operatorname{Spec} K)$ is not injective.