Singularities, Monodromy and Zeta Functions
Blatt 5

Exercises for presentation in the exercise class on 22.11.2018

Aufgabe 1:

Suppose $s, k \in \mathbb{N}$ are given and $f(t) = \sum b_i t^i$ is a polynomial such that $\min v(b_i) = 0$ and has collision depth bounded by k on $\mathbb{Z}_p^\times$.

Show that there exists l such that, whenever $t, t' \in \mathbb{Z}_p^\times$ with $\mathrm{res}_l(t) = \mathrm{res}_l(t')$,

(a) $v(f(t)) = v(f(t'))$; and

(b) $\mathrm{ac}_s(f(t)) = \mathrm{ac}_s(f(t'))$.

(c) Write down an $l \in \mathbb{N}$ satisfying both (a) and (b) above explicitly in terms of the k, s given.