Singularities, Monodromy and Zeta Functions
Blatt 8

Exercises for discussion in the exercise class on 13.12.2018

Aufgabe 1:

Let $\varphi : K[x_1, ..., x_n] \hookrightarrow D_n$ be the natural embedding of the polynomial ring $K[\underline{x}]$ into the Weyl algebra $D_n \subseteq \mathrm{End}_K(K[\underline{x}])$.

Prove that, for any $i \in \{1, ..., n\}$ and $g \in K[\underline{x}]$,

$$[\partial_i, \varphi(g)] = \varphi\left(\frac{\partial g}{\partial x_i}\right).$$

Aufgabe 2:

Let K be a field and consider the vector space K^ω. Let x and ∂ operate on K^ω with

$$x(a_i)_{i\in\omega} = (0, a_0, a_1, ...)$$

and

$$\partial(a_i)_{i\in\omega} = (a_1, 2a_2, 3a_3, ...).$$

Show that the K-sub-algebra of $\mathrm{End}_K(K^\omega)$ generated by x and ∂ is isomorphic to $D_1(K)$.