Mathematisches Institut
der Universität München
Prof. Dr. B. Pareigis

WS 2001/02
Set 11

Problem set for Advanced Algebra

(41) Let K be a field. Show that $(K \times K)$- Mod is not equivalent to K- Mod.

(42) Show that $\mathbb{R}$- Mod $\ncong \mathbb{C}$- Mod (not equivalent).

(43) Let K be a field, $B := M_n(K)$, ${}_KP_B := K^n$ the set of row vectors, ${}_BQ_K$ the set of column vectors. Find $f : P \otimes_B Q \to K$ and $g : Q \otimes_K P \to B$, such that (K, B, P, Q, f, g) is a Morita context. Is this a strict Morita context? Determine the center of B and the set of twosided ideals of B.

(44) Determine the image of the maps f and g in the canonical Morita context (A, B, P, Q, f, g) for
(a) $A := \mathbb{Z}/(6)$ and $P := \mathbb{Z}/(2)$,
(b) $A := \mathbb{Z}/(4)$ and $P := \mathbb{Z}/(4) \oplus \mathbb{Z}/(2)$,
(c) $A := \mathbb{Z}/(6)$ and $P := \mathbb{Z}/(6) \oplus \mathbb{Z}/(2)$.

Due date: Tuesday, 15.1.2002, 16:15 in Lecture Hall 138