

MAT 534: HOMEWORK 11

Problems marked by asterisk (*) are optional.

- *1.** Let F be a field and let $S = \text{Mat}_{m \times m}(F)$ and $R = \text{Mat}_{n \times n}(F)$ be algebras of $m \times m$ (respectively $n \times n$) matrices. Let $A = \text{Mat}_{m \times n}(F)$ be the space of $m \times n$ matrices considered as (S, R) -bimodule.

 - (a) Prove that $A \otimes_R F^n = F^m$ (as S -module).
 - (b) Compute $A \otimes_R B$, where $B = \text{Mat}_{n \times k}(F)$.
- *2.** Dummit and Foote, exercises 3, 4, 11, 12, 17, 18, 20, 25 on pp. 375-377.