H25

(ii) Weiter $\sum_{j=1}^{m} a_{ij} f_{jk} = a_{ik} f_{kk} \overset{K \text{ Körper}}{=} f_{kk} \cdot a_{ik} \quad \forall\, 1 \le i \le m,\ 1 \le k \le n$

$$\Rightarrow AF = \begin{pmatrix} f_{11} a_{11} & \cdots & f_{mm} a_{1n} \\ \vdots & & \vdots \\ f_{11} a_{m1} & \cdots & f_{mm} a_{mn} \end{pmatrix} = \left(f_{11} a_{\cdot 1}, \ldots, f_{mm} a_{\cdot n} \right)$$

(iii) Für $B = (b_{ik})_{ik}$ mit $b_{jj} = 1$, $b_{i,k} = 0$ sonst gilt

$$\forall_{\substack{1 \le i \le m \\ 1 \le k \le n}} \quad \sum_{v=1}^{m} \underbrace{a_{iv} b_{vk}}_{=0 \ \forall v,k \neq j} = \begin{cases} a_{ij} b_{jj} & j = k \\ 0 & \text{sonst} \end{cases} = \begin{cases} a_{ij} & j = k \\ 0 & \text{sonst} \end{cases}$$