

Hausaufgabe

1. ([1], Ex. 5.1, 24)

$$A = \begin{bmatrix} 3 & 3 & 4 \\ -3 & -1 & -5 \\ 12 & 14 & 14 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ -1 & 1 & 0 \\ 4 & 1 & 1 \end{bmatrix} \begin{bmatrix} 3 & 3 & 4 \\ 0 & 2 & -1 \\ 0 & 0 & -1 \end{bmatrix}$$

- (a) $|A| = ?$
(b) $|A^{-1}| = ?$
(c) $A(A^T A)^{-1} A^T = ?$

2. ([1], Ex. 5.1, 27)

- (a)

$$\begin{vmatrix} 0 & x & 0 \\ 0 & 0 & y \\ z & 0 & 0 \end{vmatrix} = ?$$

- (b)

$$\begin{vmatrix} 0 & 0 & 0 & x \\ u & 0 & 0 & 0 \\ 0 & v & 0 & 0 \\ 0 & 0 & w & 0 \end{vmatrix} = ?$$

- (c)

$$\begin{vmatrix} x & x & x \\ x & y & y \\ x & y & z \end{vmatrix} = ?$$

3. ([1], Ex. 5.1, 18)

$$\begin{vmatrix} 1 & x & x^2 \\ 1 & y & y^2 \\ 1 & z & z^2 \end{vmatrix} = ?$$

Literatur

- [1] G. Strang. *Introduction to Linear Algebra*. Wellesley-Cambridge Press, third edition, 2003.