Oplossingen Hoofdstuk 2

Hieronder staan antwoorden voor enkele oefeningen uit Hoofdstuk 2.

1.

- $\det A_1 = 22$
- $\det A_2 = -32$
- $\det A_3 = \frac{1}{52}$
- $\det A_4 = -2$
- $\det A_5 = 0$
- $\det A_6 = 12$
- $\det A_7 = -14$
- $\det A_8 = 0$
- $\det A_9 = -120$
- $\det A_{10} = -12$

2. $\det(A^2BA^{-1}) = -21$ en $\det(B^{-1}A^3) = -\frac{343}{3}$.

3. $x \in \{-2, 0, 1, 4\}$

4.
- $\det A_1 = -6$
- $\det A_2 = 72$
- $\det A_3 = -6$

6. (a) $-\frac{1}{7}$ (b) $-\frac{8}{7}$ (c) $-\frac{1}{56}$

9. $k \in \mathbb{R}\backslash\{-4, -1\}$

14.
- $C_{11} = -2$
- $C_{12} = 7$
- $C_{13} = -8$
- $C_{33} = 3$

18.

A_1

- $\det A_1 = -7$
- $\text{adj } A_1 = \begin{pmatrix} 2 & -7 & -6 \\ 1 & -7 & -3 \\ -4 & 7 & 5 \end{pmatrix}$
- $\det(\text{adj } A_1) = 49$
- $A_1^{-1} = \begin{pmatrix} -\frac{2}{7} & 1 & \frac{6}{7} \\ -\frac{1}{7} & 1 & \frac{3}{7} \\ \frac{4}{7} & -1 & -\frac{5}{7} \end{pmatrix}$

A_2

- $\det A_2 = 12$
- $\text{adj } A_2 = \begin{pmatrix} 1 & 8 & -5 \\ -10 & 4 & 2 \\ 7 & -4 & 1 \end{pmatrix}$
- $\det(\text{adj } A_2) = 144$
- $A_2^{-1} = \begin{pmatrix} \frac{1}{12} & \frac{2}{3} & -\frac{5}{12} \\ -\frac{5}{6} & \frac{1}{3} & \frac{1}{6} \\ \frac{7}{12} & -\frac{1}{3} & \frac{1}{12} \end{pmatrix}$

A_3

- $\det A_3 = 1$
- $\operatorname{adj}\ A_3 = \begin{pmatrix} \cos\theta & 0 & \sin\theta \\ 0 & 1 & 0 \\ -\sin\theta & 0 & \cos\theta \end{pmatrix}$
- $\det(\operatorname{adj}\ A_3) = 1$
- $A_3^{-1} = \operatorname{adj}(A_3)$

A_4

- $\det A_4 = 1$
- $\operatorname{adj}\ A_4 = \begin{pmatrix} -4 & 3 & 0 & -1 \\ 2 & -1 & 0 & 0 \\ -7 & 0 & -1 & 8 \\ 6 & 0 & 1 & -7 \end{pmatrix}$
- $\det(\operatorname{adj}\ A_4) = 1$
- $A_4^{-1} = \operatorname{adj}\ A_4$

19.

$$\begin{pmatrix} -3i & 0 & 0 \\ 4 & i-1 & 0 \\ 10+16i & -5-3i & 3i+3 \end{pmatrix}$$

23.

$$\operatorname{adj} A = \begin{pmatrix} 3 & -5 & 2 \\ 0 & -1 & 1 \\ -6 & 8 & -5 \end{pmatrix} \text{ en } A^{-1} = \begin{pmatrix} -1 & \frac{5}{3} & -\frac{2}{3} \\ 0 & \frac{1}{3} & -\frac{1}{3} \\ 2 & -\frac{8}{3} & \frac{5}{3} \end{pmatrix}.$$

25. $(x, y, z) = (2, -\frac{3}{2}, -\frac{11}{2})$

27. $k \in \{-1, 0, 1\}$

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