Huiswerk Wiskunde voor Neurale Netwerken
Inleveren 7 oktober om 11:15

1. Consider the following matrices and describe what linear transformations they define.

$$\begin{pmatrix} 1 & 0 \\ 0 & 2 \end{pmatrix} \quad \begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix} \quad \begin{pmatrix} \cos\alpha & 0 & -\sin\alpha \\ 0 & 1 & 0 \\ \sin\alpha & 0 & \cos\alpha \end{pmatrix}$$

2. Find the matrix of the transformation of symmetry with respect to the line given by vector $(1, 2)$ in $\mathbb{R}^2$.

3. Find the matrix of the rotation in $\mathbb{R}^3$ with respect to the line given by vector $(1, 1, 1)$ to the angle α.

4. Find the rank of the matrix

$$\begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 2 & 4 & 6 \end{pmatrix}$$

5. (a) Check whether the following set is a linear space, motivate your answer.

$$M = \{ \begin{pmatrix} 0 \\ a \\ b \end{pmatrix} : a, b \in \mathbb{R} \text{ and } a + b = 1 \}$$