



Assessment Exam (T01)

Exercise 1: (6pts)

I. Let A be a matrix given by

$$A = \begin{pmatrix} 1 & -2 \\ 2 & 1 \end{pmatrix},$$

1. Is A antisymmetric ?
2. Calculate : A^2 , A^{-1} , $A \times A^T$, $\det(A^T A)$, $\det(A^3)$, $(AA^T)^T(A - 3I)$.
3. Is the equality $(A^{-1})^2 = (A^2)^{-1}$ valid ?
4. Determine the scalar ϵ such that $5A^{-1} = -A + \epsilon I$.

II. Let B be a (2×2) antisymmetric matrix such that :

$$B \begin{pmatrix} 1 \\ 2 \end{pmatrix} = \begin{pmatrix} 2 \\ -1 \end{pmatrix}$$

1. Determine the matrix B .

Exercise 2: (4.5 pts)

Consider the following matrix :

$$B = \begin{pmatrix} 0 & 1 & 1 \\ 1 & 2 & 3 \\ -2 & 3 & 2 \end{pmatrix}$$

1. By using row reduction method compute $\det(B)$
2. Is B invertible ? If yes, determine B^{-1} .
3. Determine α and β such that $B \begin{pmatrix} 1 \\ 4 \\ \alpha \end{pmatrix} = \begin{pmatrix} \beta \\ \alpha \\ 1 \end{pmatrix}$.