Assignment 5

Due on 2023-01-24, 20:00 UTC

The task here generalizes the exercise from page 2. As per our course, we have not classified the assignment.

Problem 1

Let $A = egin{pmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m1} & a_{m2} & \cdots & a_{mn} \end{pmatrix}$

(a) Is $A$ a square matrix? Why or why not?

(b) Is $A$ invertible? Why or why not?

(c) Compute $A^{-1}$ if it exists. Otherwise, explain why $A$ is not invertible.

Problem 2

Let $B = \begin{pmatrix} b_{11} & b_{12} & \cdots & b_{1n} \\ b_{21} & b_{22} & \cdots & b_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ b_{m1} & b_{m2} & \cdots & b_{mn} \end{pmatrix}$

(a) Is $B$ a square matrix? Why or why not?

(b) Is $B$ invertible? Why or why not?

(c) Compute $B^{-1}$ if it exists. Otherwise, explain why $B$ is not invertible.

Problem 3

Let $C = \begin{pmatrix} c_{11} & c_{12} & \cdots & c_{1n} \\ c_{21} & c_{22} & \cdots & c_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ c_{m1} & c_{m2} & \cdots & c_{mn} \end{pmatrix}$

(a) Is $C$ a square matrix? Why or why not?

(b) Is $C$ invertible? Why or why not?

(c) Compute $C^{-1}$ if it exists. Otherwise, explain why $C$ is not invertible.

Problem 4

Let $D = \begin{pmatrix} d_{11} & d_{12} & \cdots & d_{1n} \\ d_{21} & d_{22} & \cdots & d_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ d_{m1} & d_{m2} & \cdots & d_{mn} \end{pmatrix}$

(a) Is $D$ a square matrix? Why or why not?

(b) Is $D$ invertible? Why or why not?

(c) Compute $D^{-1}$ if it exists. Otherwise, explain why $D$ is not invertible.