Lecture 9: Worksheet

Inverting matrices

1 Invert the matrix

$$\begin{bmatrix} 1 & 2 & 3 \\ 1 & 1 & 1 \\ 1 & 0 & 0 \end{bmatrix}$$

using Gauss Jordan elimination. Here is the augmented matrix to start with

$$\left[\begin{array}{ccc|ccc} 1 & 2 & 3 & 1 & 0 & 0 \\ 1 & 1 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 0 & 1 \end{array}\right] .$$

Matrix algebra

Solve the following equations for the matrix X. You can assume that the matrices A, B, C are all invertible $n \times n$ matrices and that $1 = 1_n$ is the identity matrix.

2 $AX = B$

3 $AXB = C$

4 $(XB)^{-1} = D$

5 $A = (X - 1)^{-1}$