

University of Technology Sydney
Department of Mathematical and Physical Sciences

37233 Computational Linear Algebra
Tutorial Assignment 1

Question 1.

Solve the linear system

$$x_1 - 2x_2 - x_3 + x_4 = -1$$

$$2x_1 - 4x_2 - 2x_3 + 5x_4 = 1$$

$$2x_1 - 4x_2 - x_3 + 4x_4 = 1$$

$$-x_1 + 2x_2 + 3x_3 + 2x_4 = 6$$

Question 2.

Find all solutions of the system:

$$2x_1 + 4x_2 + x_3 - 3x_4 - 3x_5 = -5$$

$$x_1 + 2x_2 + x_4 - x_5 = -1$$

Question 3.

Calculate the determinants of following matrices $\mathbf{A} = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$, $\mathbf{B} = \begin{pmatrix} 1 & 0 & 1 & 2 \\ 1 & 3 & 0 & 2 \\ -2 & 3 & 1 & 0 \\ 1 & 0 & 0 & 6 \end{pmatrix}$.

Question 4.

Determine whether or not the matrix

$$\begin{pmatrix} 5 & -2 & 3 \\ 0 & 1 & 7 \\ 2 & -1 & 0 \end{pmatrix}$$

is non-singular, and if it is, find its inverse

Question 5.

For which value of h matrix \mathbf{A} is singular?

$$\mathbf{A} = \begin{pmatrix} 1 & -1 & -3 \\ -1 & 2 & 5 \\ 2 & 1 & h \end{pmatrix}$$