

CS1003 Homework II

This homework will be marked out of 10.

Please write your **NAME** and **CS1003** on the top of the first page.
Submit your solution online via the CS1003 page on mymodule.tcd.ie. Your assignment should be submitted by **8pm on Thursday 4th October**.

Q1 (4 marks)

Solve the following system of linear equations using Gaussian Elimination

$$\begin{aligned}x + 3y + z &= 0 \\ -x + y + z &= 0 \\ x + 5y + 2z &= 0\end{aligned}$$

Q2 (4 marks)

Find the inverse of the following matrix using elementary row operations

$$\begin{pmatrix} 1 & -1 & 1 \\ 1 & 1 & 2 \\ 1 & 2 & 2 \end{pmatrix}$$

Q3 (2 marks)

Find the solution of the following set of equations using Cramer's rule:

$$\begin{aligned}2x + 3y &= 11 \\ 3x + 2y &= 11\end{aligned}$$

Note: To obtain full marks you will need to lay your work out in clear logical steps so that the reader can see exactly how you obtain one line from the previous one. You should show all your workings clearly, in particular please use equal signs where appropriate. Don't be afraid to use sentences in English to help explain what you are doing and why. Remember that Gaussian Elimination/Gauss-Jordan elimination requires you to reduce the matrix to reduced row echelon form.

Homework Submission: Submit your work as a **SINGLE PDF FILE**. Please submit handwritten work that you have scanned or taken photos of. Remember to combine your scanned files into a single pdf if necessary. Typeset work (e.g. that created using LaTeX or Microsoft Word with equation editor) will only be allowed in exceptional circumstances – please email Meriel.Huggard@tcd.ie to obtain permission to typeset your work.