

## HOMEWORK 2

MA1111: LINEAR ALGEBRA I, MICHAELMAS 2016

Solutions are due at the beginning of class on **Thursday, October 13**. Please put your name and student number, as well as your subject (Maths., TP, or TSM) on the back of your assignment, and make sure to staple your papers. In general, work must always be shown to get full credit.

- (1) Use Gauss-Jordan elimination to solve the system of linear equations

$$\begin{cases} x_1 - 2x_2 - 6x_3 = 12 \\ 2x_1 + 4x_2 + 12x_3 = -17 \\ x_1 - 4x_2 - 12x_3 = 22. \end{cases}$$

- (2) Consider the augmented matrix

$$\left( \begin{array}{cccc|c} 1 & -2 & 2 & -1 & 3 \\ 3 & 1 & 6 & 11 & 16 \\ 2 & -1 & 4 & 4 & 9 \end{array} \right).$$

- (a) Write the system of linear equations corresponding to this augmented matrix.  
(b) Find the reduced row echelon form of this matrix.  
(c) Use your answer from (b) to determine a solution set for the system you found in (a).
- (3) Find the span in  $\mathbb{R}^3$  of the vectors

$$v_1 = \begin{pmatrix} 1 \\ 3 \\ 3 \end{pmatrix}, \quad v_2 = \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix}, \quad v_3 = \begin{pmatrix} 1 \\ 3 \\ 1 \end{pmatrix}.$$

- (4) Find the reduced row echelon form of the matrix

$$\begin{pmatrix} 2 & 4 & 2 & 1 \\ 4 & 3 & 0 & -1 \\ -6 & 0 & 2 & 0 \\ 0 & 1 & 1 & 2 \end{pmatrix}.$$