MAST10007 (Summer) Assignment 1 Due Mon. Jan. 11th 1.30 p.m.

Please leave your assignment in your tutor's box located near the north entrance to the Richard Berry building. Make sure that you have written your name, your student number, your tutor's name, and your tutorial time on the standard (plagiarism) cover sheet, which must be signed.

1. In the word problem on page 4 of the slides, the following linear system for the unknowns A, B, a, b was obtained,

$$\begin{aligned} A + B &= 91 \\ A &= 3b \\ a &= 2B \\ A - B &= a - b \end{aligned}$$

   (a) Write this system in augmented matrix form, making sure you show any intermediate working.

   (b) Reduce the augmented matrix to row echelon form.

   (c) Apply the method of back substitution to now solve the linear system.

2. (a) Use an algorithm based on fully reduced row echelon form to find the inverse of the matrix

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 2 & 2 & 0 & 0 \\ 3 & 3 & 3 & 0 \\ 4 & 4 & 4 & 4 \end{bmatrix}$$

   (b) Use your answer to (a) to deduce the inverse of

$$\begin{bmatrix} 2 & 4 & 6 & 8 \\ 0 & 4 & 6 & 8 \\ 0 & 0 & 6 & 8 \\ 0 & 0 & 0 & 8 \end{bmatrix}$$