

Name: \_\_\_\_\_  
Student ID: \_\_\_\_\_

## Quiz 4

This quiz is graded out of 10 marks. No books, calculators, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

**Question 1.** (5 marks) §1.6 # 9 Solve the linear systems together by reducing the appropriate augmented matrix.

$$\begin{array}{rcl} x_1 & - & 5x_2 = b_1 \\ 3x_1 & + & 2x_2 = b_2 \end{array}$$

$$(i) b_1 = 1, b_2 = 4 \quad (ii) b_1 = -2, b_2 = 5$$

**Question 2.** §1.7 # 32 Let  $A$  be an  $n \times n$  symmetric matrix.

- (2 marks) Show that  $A^2$  is symmetric.
- (3 marks) Show that  $2A^2 - 3A + I$  is symmetric.

**Question 3.** (5 marks) Consider the matrices:

$$A = \begin{bmatrix} 1 & -1 & 2 \\ 0 & 2 & -3 \\ 2 & 3 & 4 \end{bmatrix}, B = \begin{bmatrix} 2 & 2 & 1 \\ 0 & -4 & 0 \end{bmatrix} C = \begin{bmatrix} 0 & 1 \\ -3 & 0 \\ 3 & -1 \end{bmatrix} D = \begin{bmatrix} 0 & 1 \\ 1 & -2 \end{bmatrix}$$

Find  $E$ , if possible.

$$(I - DE)^{-1} = (BC)^t$$