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. §1.6 #22 *(5 marks)* Let $A\mathbf{x} = \mathbf{0}$ be a homogeneous system of n linear equations in n unknowns, and let Q be an invertible $n \times n$ matrix. Show that $A\mathbf{x} = \mathbf{0}$ has just the trivial solution if and only if $(QA)\mathbf{x} = \mathbf{0}$ has just the trivial solution.

Question 2. §1.7 #34 *(5 marks)* Find all 3×3 diagonal matrices A that satisfy $A^2 - 3A - 4I = 0$.

Bonus. *(5 marks)* Prove: $AB = BA$ if and only if $(A+B)(A-B) = (A-B)(A+B)$