MATA33 – Quiz 2 **Score: _____/30**

Name: _____Student Number: _____

***To earn full credits, you must show sufficient amount of work. ***

1. [8pt] Find the conditions so that the following system has (a) no solution (b) a unique solution and (c) infinitely many solutions.

$$x + 4y - 2z = 4$$

$$2x + 7y - z = -2$$

$$2x + 9y + \alpha z = \beta$$

2. [6pt] If A is an n × n matrix and $A^T A = A$ show that A is symmetric and $A = A^2$

3. [6pt] Simplify $(A(CB)^T + (CBA)^T)^T$ where A,B,C are square matrices with the same size.

4. [10pt] Find the solutions for the homogenous linear system**,** whose coefficient matrix is

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