Dawson College: **Linear Algebra** (SCIENCE): 201-NYC-05-S8: Winter 2024: **Quiz 3** name: _____

Books, watches, notes or cell phones are **not** allowed. The **only** calculators allowed are the Sharp EL-531**. You **must** show all your work, the correct answer is worth 1 mark the remaining marks are given for the work.

Question 1.[1] *(1 mark each)* Complete each of the following sentences with MUST, MIGHT, or CANNOT.

a. Let A be a square matrix such that not all entries are zero. All entries of AA _____ be equal to zero.

b. If B has a column of zeros and the product AB is defined then AB _____ have a column of zeros.

c. If A has a row of zeros and the product AB is defined then AB _____ have a row of zeros.

Question 2.*(4 marks)* Find **all** matrices A where

$$A + 3A^T = \begin{bmatrix} 12 & 2 \\ -10 & 4 \end{bmatrix}$$

Question 3.*(3 marks)* Prove: If AB and BA are both defined, then AB and BA are square matrices.

[1] From or modified from a John Abbott final examination