Dawson College: **Linear Algebra** (SCIENCE): 201-NYC-05-S7: Fall 2022: **Quiz 1** 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. *(2 marks)* Determine whether the following statement is true or false. If the statement is false provide a counterexample. If the statement is true provide a proof of the statement.

If the number of equations in a linear system exceeds the number of unknowns, then the system must be inconsistent.

Question 2. *(3 marks)* Find all values of k for which the given augmented matrix corresponds to a consistent linear system.

$$\begin{bmatrix} 3 & -4 & k \\ -6 & 8 & 5 \end{bmatrix}$$

Question 2. *(3 marks)* Given the linear system $\begin{cases} x- \ y+ \ z=b_1 \\ 2x-2y-2z=b_2 \\ x+3y-5z=b_3 \end{cases}$. Determine the b_i if the linear system has the particular solution $(3,-2,1)$.

Question 3. *(3 marks)* You have a system of k equations in two variables, $k \geq 2$. Explain the geometric significance of

a. No solution.

b. A unique solution.

c. An infinite number of solutions.

Question 4. *(2 marks)* Is there a two-unknowns linear system whose solution set is all of $\mathbb{R}^2$?