Dawson College: Winter 2019: Linear Algebra (SCIENCE): 201-NYC-05-S6: **Quiz 6** name: _____

No books, watches, 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.

**Question 1.**[1] *(5 marks)* If $A = \begin{bmatrix} k & 3 & 1 \\ 0 & 1 & 0 \end{bmatrix}$, show that $\det(AA^T) \neq \det(A^TA)$ for every $k \in \mathbb{R}$.

**Question 2.** *(5 marks)* Use elementary operations to show that

$$\begin{vmatrix} 1 & 1 & 1 \\ a & b & c \\ a^2 & b^2 & c^2 \end{vmatrix} = (b-a)(c-a)(c-b)$$

**Question 3.** *(5 marks)* Find the determinant of the matrix $A$.

$$A = \begin{bmatrix} 1 & \det(A) & 1 & a \\ -2 & 3 & 1 & b \\ 2 & 5 & 0 & c \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

[1] From a Dawson College Final Examination