Dawson College: **Linear Algebra** (SCIENCE): 201-NYC-05-S7: Fall 2022: **Quiz 9** 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. *(4 marks)* Let A, B, C, D, E, and F be the vertices of a regular hexagon[1], taken in order. Show that $\vec{AB}+\vec{AC}+\vec{AD}+\vec{AE}+\vec{AF}=3\vec{AD}$

Question 2. *(3 marks)* If $\vec{u}=(0,1,1)$ and $\vec{v}=(p,4,p)$ then find the parameter p such that the angle between $\vec{u}$ and $\vec{v}$ is $\pi/3$.

Question 3. If the statement is false provide a counterexample. If the statement is true provide a proof of the statement.

1. *(3 marks)* The diagonals of a rhombus[2] are perpendicular to each other.

[1] An *hexagon* is a closed geometrical shape with six sides and six angles. If an hexagon has equal sides and equal angles, then it is called a *regular hexagon.*

[2] A parallelogram with all sides of equal length is called a *rhombus*.