Dawson College: **Linear Algebra and Vector Geometry**: 201-SN4-RE-S6: Winter 2026: **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. *(3 marks each)* Determine whether the following statements are true or false. If a statement is false provide a counterexample. If it is true provide a proof.

    a. If $A^4 = 2I$, then the matrix A is invertible.

    b. If $AB = B$ and B is a nonzero matrix, then the matrix A is invertible.

Question 2. *(4 marks)* Solve for the matrix X if $AX(D+BX)^{-1} = C$. Assume that all matrices are $n \times n$ and invertible as needed.

Question 3. *(5 marks)* Let $B^{-1}A = \begin{bmatrix} 1 & 2 & 1 \\ 1 & 1 & 1 \\ 2 & 1 & 1 \end{bmatrix}$ and $BX^{-1}A^{-1} = I_3$. Find the matrix X.

Question 4. *(5 marks)* Express the above $B^{-1}A$ as a product of elementary matrices, if possible.