King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 260 – Term 172 – Quiz 4

Name:
Student ID #:

Question 1. Consider the matrix $B = \begin{bmatrix} -1 & -1 \\ -2 & 0 \end{bmatrix}$. Use Cayley Hamilton Theorem, to calculate B^2, B^3 and B^{-1}.

QUESTION 2 IS ON THE BACK OF THE PAGE.

Question 2. Consider the matrix $A = \begin{bmatrix} 1 & 3 & 0 \\ 3 & 1 & 0 \\ 0 & 0 & -2 \end{bmatrix}$

(a) Find the eigenvalues and the corresponding eigenvectors of the matrix A.

(b) Find a basis and the dimension of eigenspace of each eigenvalue.

(c) Explain why the matrix A is diagonalizable.

(d) Find a diagonal matrix D and an invertible matrix P so that $A = PDP^{-1}$.