Math 270 HW#10

Name:_____ Date:_____

Show your work very clearly, neatly, and box your final answer.

One Side Only

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1. For the matrix $\begin{bmatrix} 5 & 6 & 2 \\ 0 & -1 & -8 \\ 1 & 0 & -2 \end{bmatrix}$

a. Find the characteristic equation.

b. Find the eigenvalues and corresponding eigenvectors of the matrix.

c. Find the determinant and the trace of the matrix.

d. Find the adjoint of the matrix.

e. Find the trace of the adjoint of the matrix.

f. Find the inverse of the matrix.

g. Find the LU factorization of the matrix.

2. Prove that for any 2×2 matrix A, the characteristics equation is $\lambda^2 - tr(A)\lambda + \det(A) = 0$.

Given: $A = \begin{bmatrix} 1 & 2 & 2 \\ 1 & 4 & 6 \\ -1 & -2 & -4 \end{bmatrix}$**, Find**

1. $\text{adj}(A)$

2. $\det(A)$

3. Find the trace of the matrix A, and the adjoint of the matrix A.

4. A^{-1} by using the adjoint and the determinant of A**.**

5. Find all the characteristic polynomial of matrix A.

6. Find all the eigenvalues of matrix A.

7. Verify the determinant of the matrix A is equal to the product of its eigenvalues.

8. Find all the eigenvectors of the matrix A.