

Math 3160 - Quiz 5

Name: _____

To receive credit you must show your work.

1. Find the eigenvalues and eigenvectors for

$$A = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}, \text{ and } B = \begin{bmatrix} 0 & 0 \\ 1 & 0 \end{bmatrix}.$$

2. Find the eigenvalues and eigenvectors for

$$A = \begin{bmatrix} 1 & 3 \\ 3 & 1 \end{bmatrix}, B = \begin{bmatrix} 0 & 1 & 0 \\ 2 & -3 & 0 \\ 0 & 0 & 0 \end{bmatrix}, \text{ and } C = \begin{bmatrix} 0 & 1 & 0 \\ -4 & -4 & 0 \\ 0 & 0 & 0 \end{bmatrix}.$$

3. Using matrices A and B from Problem 2

- (a) Define a matrix M with the columns of matrix M being the eigenvectors of A . Compute M^{-1} and compute MAM^{-1} .
- (b) Define a matrix M with the columns of matrix M being the eigenvectors of B . Compute M^{-1} and compute MBM^{-1} .
- (c) Do you notice anything?
- (d) Can you do this for matrix C ?