MEEG 4703 Quiz M3.073

1. (10 points) Find the eigenvalues and eigenvectors of the matrix **A** shown.

$$\mathbf{A}=\begin{bmatrix} 5 & 1 & 0 \\ 0 & 5 & -9 \\ -5 & -1 & 0 \end{bmatrix} \qquad \mathbf{B}=\begin{bmatrix} -2 & 2 \\ -2 & 3 \end{bmatrix}$$

2. (10 points) Using Cayley-Hamilton theorem, compute $\mathbf{B}^{11}$ for the matrix **B** shown.

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1. $\lambda_1=0,\ \ \lambda_2=2,\ \ \lambda_3=8$

$$\mathbf{K}_1=\begin{bmatrix} -9 \\ 45 \\ 25 \end{bmatrix},\quad \mathbf{K}_2=\begin{bmatrix} -1 \\ 3 \\ 1 \end{bmatrix},\quad \mathbf{K}_3=\begin{bmatrix} 1 \\ 3 \\ -1 \end{bmatrix}$$

2. $\lambda_1=-1,\ \ \lambda_2=2;\ \ c_0=682,\ \ c_1=683$

$$\mathbf{B}^{11}=\begin{bmatrix} -684 & 1366 \\ -1366 & 2731 \end{bmatrix}$$