

You have 20 minutes to complete this quiz. To receive full credit, you must justify your answers.

Name : _____

1. (5 points) Find all real eigenvalues of the following matrix A .

$$A = \begin{bmatrix} 1 & 0 & 0 \\ 2 & 2 & 1 \\ 4 & 9 & 2 \end{bmatrix}$$

2. (5 points) Find the \mathcal{B} -matrix of the linear transformation $T : \mathbb{P}_2 \rightarrow \mathbb{P}_2$ which satisfies

$$T(1 - 3t^2 + 2) = 2 - 6t^2 + 4$$

$$T(2t + t^2) = 6t + 3t^2$$

$$T(1 + t) = 0.$$

where \mathcal{B} is the basis $\{1 - 3t^2 + 2, 2t + t^2, 1 + t\}$ of \mathbb{P}_2 .