Math 214 - April 24, 2020

Quiz 9 (Sections 5.2, 5,3, 6.1)

Name: _____

Directions: Complete the following quiz on paper. Show all work necessary to receive full credit.

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

   (a) Find the characteristic polynomial of A.

   (b) Find all eigenvalues of A.

   (c) For each eigenvalue, find a basis for the corresponding eigenspace.

   (d) If possible, diagonalize A.

2. Let $\vec{u} = \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix}$ and $\vec{v} = \begin{bmatrix} 2 \\ 0 \\ 1 \\ 3 \end{bmatrix}$, find $\langle \vec{u}, \vec{v} \rangle$.