

Math 250–Section #4 Quiz #6

Name: _____

1. (4 pts) Given the matrix

$$A = \begin{bmatrix} -7 & 0 & -8 \\ 5 & -3 & 9 \\ 4 & 0 & 5 \end{bmatrix}$$

- (a) Find its characteristic polynomial.
- (b) Find the eigenvalues.
- (c) Find the algebraic and geometric multiplicities of each eigenvalue.

Answer:

2. (4 pts) For a square matrix A explain carefully:

(a) What is an *eigenvector* of A ?

(b) What is the *characteristic polynomial* of A and what purpose it serves?

(c) What is the meaning of A being *diagonalizable*?

(d) Which property the eigenvectors of A must have for A to be diagonalizable?

Answer:

3. (2 pts) Consider the matrix

$$A = \begin{bmatrix} 2 & c \\ 0 & 2 \end{bmatrix}.$$

If $c \neq 0$, show that A is NOT diagonalizable.

Answer:

Scratch