MA 26500-215   Quiz 11

July 28, 2016

1. In the following question, V is a finite dimensional vector space, W is a subspace of V and $T: V \to V$ is a linear operator (i.e., a linear map for V into itself).

   (a) (2 points) What does it mean for a set $\{\mathbf{v}_1, \ldots, \mathbf{v}_n\}$ to be a basis for V?

   (b) (2 points) What is the meaning of $\dim V$?

   (c) (2 points) What is an eigenvalue of T? What is an eigenvector?

   (d) (2 points) When is a linear operator T diagonalizable?

   (e) (2 points) If λ is an eigenvalue of T with respect to W, is λ an eigenvalue of T with respect to V?

2.

3. (4 points) Suppose that A and B are conjugate matrices. Show that if λ is an eigenvalue of A then it is an eigenvalue of B.