

Instructor: Tatsunari Watanabe  
TA: Carlos Salinas

Name: \_\_\_\_\_.

## 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  $T: V \rightarrow V$  is a linear operator (i.e., a linear map for  $V$  into itself).
  - (a) (2 points) What does it mean for a set  $\{v_1, \dots, v_n\}$  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  $\lambda$  is an eigenvalue of  $T$  with respect to  $W$ , is  $\lambda$  an eigenvalue of  $T$  with respect to  $V$ ?
- 2.
3. (4 points) Suppose that  $A$  and  $B$  are conjugate matrices. Show that if  $\lambda$  is an eigenvalue of  $A$  then it is an eigenvalue of  $B$ .