

**應用數學系碩士班**

國立臺南大學105學年度 　 　　　　　　　　 招生考試 線性代數 試題卷

1. (a) (10%) 解釋對應矩陣row operations的三種elementary matrices。

(b) (10%) 求出這三種elementary matrices的determinants。

1. (15%) 用矩陣*A*來解釋algebraic multiplicities of an eigenvalue and geometric multiplicities of an eigenvalue；其中the characteristic polynomial of *A* is 。



1. (a) (5%) 說明何為一個矩陣的nullity。

(b) (10%) 求出下列矩陣的nullity。



1. (10%) Let with the following operations:

Show that V together with operations is not a real vector space. You must explain two rules it violates.

1. (10%) Let

Show that W is a vector subspace of and find the dimension of W.

1. (15%) Define a map by

.

Show that T is a linear transformation. What is the nullity of T? Find a basis for the range space R(T).

1. (15%) Let be a linear transformation defined by the matrix H with respect to the bases B and D:

What is ? What is ?