**Department of Aerospace Engineering**

**AE602 Mathematics for Aerospace Engineers**

**Assignment No. 2**

1. If an by matrix multiplies an -dimensional vector , how many separate multiplications are involved? What if multiplies an by matrix ?
2. Write down the 3 by 2 matrices and which have entries and
3. True or false; give a specific counterexample when false.
4. If the first and third columns of are the same, so are the first and third columns of
5. If the first and third rows of are the same, so are the first and third rows of
6. If the first and third rows of are the same, so are the first and third rows of
7. Suppose commutes with every 2 by 2 matrix and in particular

commutes with and

Show that and If for all matrices and is a multiple of the identity.

1. In summation notation, the entry of is

If and are by matrices with all entries equal to 1, find

The same notation turns associative law into

Compute both sides if is also with every

1. The matrices that "rotate" the plane are

1. Verify from the identities for and
2. What is times
3. Apply elimination to produce the factors and for

and and

1. Find and and if

1. (a) Under what conditions is nonsingular, if is the product

(b) Solve the system starting with

1. Solve by elimination, exchanging rows when necessary:

and

Which permutation matrices are required?