Temple University

Department of Economics

Economics 8009

1. Prove that the distributive property holds for matrix addition and matrix

multiplication. In other words, suppose A, B, and C are matrices such that A(B + C)

makes sense. Prove that AB + AC makes sense, and that A(B + C) = AB + BC

1. Prove that matrix multiplication is associative.In other words, suppose A;B; and

C are matrices such that (AB)C makes sense.Prove that A(BC) makes sense and that

A(BC) = (AB)C

1. Let V be a vector space and P be an operator on V: Prove that if P satisfies P2= P; then trace(P) is

non-negative.

1. For this question use the following:

Let $A=\left[\begin{matrix}-0.873&1.50&0.622&-0.677\\-0.31&-0.40&1.02&0.05\\0.22&-1.07&0.42&-1.00\\-1.43&1.08&0.43&-0.14\end{matrix}\right]$

Use a computer program of your choice to:

1. Find A-1.
2. Find the eigenvalues of A, their inverses, their product, and their sum.
3. Find the determinant and the trace of A.
4. What is the relationship between the sum of the eigenvalues and the trace of A?
5. What is the relationship between the determinant of A and the product of its eigenvalues?
6. Find the eigenvalues, the determinant, and the trace of A-1.
7. What is the relationship between the eigenvalues of A and the eigenvalues of A-1.