

	PAGE
-	AI61003 Lineau Algebra for AIRML
	Assignment 02 - Problem 01
	Let A E Ruxu. Fou any x E Ru-doy
	For any x & Rn-dog
	11 Ax112 \ max 1 Ax112
	11x112 x +0 11x112
	By definition, IIAII2 = max II AxII2
	x #0   x  2
	: 11 A x 112 < 11 A 112
	Eller 11/2 - MATRICE = (A) ADDANATION
	=)   Ax  2 \le   A  2   x  2 - 1)
	Note that 0 is tuivially time for z=0.
· · · · ·	THE PROPERTY OF THE PROPERTY O
	: 11 Axll2 & 11 All2   xll2 Yx ERM
	Considur BEIRNEN
	For xe IR" (Bx) e IR"
	: Eq = (2) holds for A (EIRMXN) and
	Br (ERY)A of money
3.1 to	LEDUM AMIANIANI DE TA DE MARANIANA
¥.1.	: MABx112 = 11A112 11Bx112
14.	Using (2) again, 113 x 112 \( 113112 11x112
- 1	o ( o o o o o o o o o o o o o o o o o o
	: 11 ABX 112 \ 11 A 112   1 B 112   1 x 112
100	for x +0 11 ABx112 < 11 A112 11 B112
1	as are consended all & Heat A existence
3	:. max    ABx   2 <    A   2    B  2
100	x + 0 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1
	에게 하는 것을 들어왔다. 그렇게 되었다면 하는 것이 되었다면 하는 것이 되었다면 하는데 되었다면 하는데 되었다면 하는데 되었다면 하는데 되었다면 하는데 되었다면 하는데 되었다면 하다. 



So, 11 AB 112 = max 11 AB x 112 (by definit") : II ABII2 \le ||AII2 ||BII2
Hence the sub-multiplicavity property
of 2-noum is proved. Yes this property holds ture for Fusberius nour too. Consider A B, C & Ruxu where C = AB

11 ABII = 11 CN p<sup>2</sup>

n n 2  $\frac{n}{1} = \sum_{i=1}^{\infty} \sum_{j=1}^{\infty} (C_{ij})^{2}$  $= \sum_{i=1}^{n} \sum_{j=1}^{n} \sum_{k=1}^{n} a_{ik} b_{kj}$ (Using Cauchy-Swantz inequality)

1 ABIIF & \( \S \) \( \S \) \( \S \) aik \( \S \) bij

i=1 j=1 [k=1 k=1 k=1]  $= \left(\frac{\sum \sum a_{ik}^{2}}{\sum b_{i}^{2}}\right) \left(\frac{\sum \sum b_{i}^{2}}{\sum b_{i}^{2}}\right)$ = || A || 2 || B || 2 11ABILE = 11Alle 11BILE : 11.11E is always non- negative 11ABILE = 11Alle 11BILE

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