Department of Applied Physics and Applied Mathematics
Columbia University

APMA S3101D: Applied Math I - Introduction to Linear Algebra

Summer 2003

Problem Set 3

Note: This is for those who use the SECOND version of the textbook. Those who have the third version of the book please go to ps2-v3.ps

(Due June 19, 2003)

1. Problem Set 3.4: 1[1], 3, 8, 19
2. Problem Set 3.5: 9, 10, 17, 35
3. Problem Set 3.6: 3, 14, 25
4. Problem Set 4.1: 4[2], 9, 13, 23

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[1]Describe the column space and nullspace of A and the complete solution to $Ax = b$:

$$\mathbf{A} = \begin{pmatrix} 2 & 4 & 6 & 4 \\ 2 & 5 & 7 & 6 \\ 2 & 3 & 5 & 2 \end{pmatrix} \mathbf{b} = \begin{pmatrix} b_1 \\ b_2 \\ b_3 \end{pmatrix} = \begin{pmatrix} 4 \\ 3 \\ 5 \end{pmatrix}$$

[2]If $AB = 0$ then the columns of B are in the ____ of A. The rows of A are in the ____ of B. Why can't A and B be 3 by 3 matrices of rank 2?