ME 352 Problem Set 6 18 November 2008

Quick Questions

Refer to the details on each problem for the expectation of the solution.

1. **(10 points)** Textbook problem 7.5. Show at least one intermediate step for each part. For example, here is my partial solution to Problem 7.3.

$$AB = \begin{bmatrix} 1 & 1 \\ 2 & 3 \end{bmatrix} \begin{bmatrix} 3 & -1 \\ -2 & 1 \end{bmatrix} = \begin{bmatrix} (1)(3)+(1)(-2) & (1)(-1)+(1)(1) \\ (2)(3)+(3)(-2) & (2)(-1)+(3)(1) \end{bmatrix}$$

$$= \begin{bmatrix} (3-2) & (-1+1) \\ (6-6) & (-2+3) \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

   It is easy to verify the correct answer using MATLAB. The point of the exercise is to practice the manual calculation.

2. **(10 points)** Textbook problem 7.14. Note that in some printings of the book there is an error in Algorithm 7.1: the statement "initialize $b =$ `zeros`$(n, 1)$" should be "initialize $b =$ `zeros`$(m, 1)$".

   Your solution should include the code listing and the MATLAB session showing that the code works. Hint: How do you know that two vectors are equal? Example 7.2 gives some useful advice.

3. **(10 – Extra Credit points)** Textbook problem 7.30. Hint: the `rank` function is helpful. Explain why.

   My solution to Problem 7.30 involves two lines of MATLAB and a two sentence explanation of how those MATLAB statements provide the answer the problem statement.

   Since we did not cover vector spaces in class on Thursday (11/13/08), Problem 7.30 will be for *extra credit*.