MATH 307

Group Homework 5

Instructions: Read textbook pages 57 to 58 before working on the homework problems. Show all steps to get full credits.

1. Write vector $\begin{pmatrix} x_1 - x_2 + 2x_3 \\ 2x_3 + x_1 \\ 3x_3 \\ 3x_4 + 3x_2 + x_1 \end{pmatrix}$ in the form Ax with $x = \begin{pmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{pmatrix}$ and A an appropriate matrix.

2. Find the matrix that represents the linear transform that reflects a two dimensional vector about y-axis and then rotate for 90 degree (counterclock wisely).

3. For each of the matrices below, specify whether it is square, rectangular, diagonal, upper-triangular or lower triangular:

$$A = \begin{pmatrix} 1-i & 3+i & 5 & 3 \\ 0 & -1 & 3 & 3-4i \end{pmatrix}, B = \begin{pmatrix} 1-i & 0 & 0 \\ 3 & 0 & 0 \\ 3 & 3 & 4i \end{pmatrix}, C = \begin{pmatrix} 3 & 0 & 0 \\ 0 & -3 & 0 \\ 0 & 0 & -i \end{pmatrix}.$$