MATH 307

Individual Homework 19

Instructions: Read textbook pages 103 to 108 before working on the homework problems. Show all steps to get full credits.

1. Let A be a 4×4 matrix, use elementary row operation matrices to find one matrix E such that $EA = B$, where B is obtained from A using the following three row operations in a row (watch for the order): multiply row 2 by -3, interchange row 1 and row 4 of the obtained matrix and then add 2 times row 2 to the third row of the newly obtained matrix. What is the inverse of this matrix E?

2. Check whether each of the following matrices is in reduced row echelon form or non-reduced row echelon form. Briefly justify your results.

   (a)
   $$A = \begin{pmatrix} 0 & 2 & 0 & -10 \\ 0 & 0 & 1 & 7 \\ 0 & 0 & 0 & 0 \end{pmatrix}$$

   (b)
   $$B = \begin{pmatrix} 0 & 1 & 8 \\ 1 & 0 & 1 \\ 0 & 0 & 0 \end{pmatrix}$$

   (c)
   $$C = \begin{pmatrix} 1 & 0 & 3 & 4 \\ 0 & 1 & 1 & 3 \\ 0 & 0 & 1 & -2 \end{pmatrix}$$

   (d)
   $$D = \begin{pmatrix} 1 & 0 & 3 & 0 \\ 0 & 1 & -1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix}$$