HOMEWORK 12

(1) Textbook: 8, page 251.

(2) Use the definition of the inverse of a matrix to show $A = \begin{pmatrix} 2 & 3 \\ 6 & 9 \end{pmatrix}$ has no inverse.

(3) Let $A = \begin{pmatrix} 1 & -2 & 3 \\ 2 & -3 & 1 \\ 3 & -5 & 4 \end{pmatrix}$. Determine E so that $EA = B = \begin{pmatrix} 1 & -2 & 3 \\ 2 & -3 & 1 \\ 0 & 0 & 0 \end{pmatrix}$. Hint. Think of elementary row operations.

(4) Let E be the elementary matrix that corresponds to the operation of multiplying the first row by λ and adding it to the second row. What is E^{-1}? What is the inverse of the elementary matrix that interchanges two rows? What is the inverse of the elementary matrix that multiplies a given row by a non-zeros scalar?

(5) Let E be the matrix in the previous problem. Let A be a general 2×3 matrix. Verify that EA is the matrix obtained by adding λ times the first row of A to the second row.

(6) Find a matrix $A \neq 0$ but $A^2 = 0$.