1-5

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Determine whether the given matrix is elementary.

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$(a)\begin{bmatrix} 1 & 0 \\ -5 & 1 \end{bmatrix}$ $(b)\begin{bmatrix} -5 & 1 \\ 1 & 0 \end{bmatrix}$

$(c)\begin{bmatrix} 1 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & 0 & 0 \end{bmatrix}$ $(d)\begin{bmatrix} 2 & 0 & 0 & 2 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$

In Exercises 5–6 an elementary matrix E and a matrix A are given. Identify the row operation corresponding to E and verify that the product EA results from applying the row operation to A.

5 a)

$$E = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}, \quad A = \begin{bmatrix} -1 & -2 & 5 & -1 \\ 3 & -6 & -6 & -6 \end{bmatrix}$$

b)

$$E = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & -3 & 1 \end{bmatrix}, \quad A = \begin{bmatrix} 2 & -1 & 0 & -4 & -4 \\ 1 & -3 & -1 & 5 & 3 \\ 2 & 0 & 1 & 3 & -1 \end{bmatrix}$$

"Determine if $ad - dc \neq 0$ then if it is find the inversion of the matrix using the standard 2x2 formula. Afterwhich use the inversion algorithm to find A^{-1}"

9 b)

$$A = \begin{bmatrix} 2 & -4 \\ -4 & 8 \end{bmatrix}$$

Use the inversion algorithm to find the inverse of the matrix (if it exists)

11 a)

$$\begin{bmatrix} 1 & 2 & 3 \\ 2 & 5 & 3 \\ 1 & 0 & 8 \end{bmatrix}$$

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$$\begin{bmatrix} 2 & 6 & 6 \\ 2 & 7 & 6 \\ 2 & 7 & 7 \end{bmatrix}$$

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$$\begin{bmatrix} 2 & -4 & 0 & 0 \\ 1 & 2 & 12 & 0 \\ 0 & 0 & 2 & 0 \\ 0 & -1 & -4 & -5 \end{bmatrix}$$

Find the inverse of the matricies where $k_{1\to 4}$ are all nonzero.

19 b)

$$\begin{bmatrix} k & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & k & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

Express the matrix and its inverse as products of elementary matricies.

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$$\begin{bmatrix} -3 & 1 \\ 2 & 2 \end{bmatrix}$$