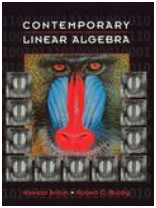
Chapter 3, Section 3 of *Contemporary Linear Algebra* by Anton and Busby



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1. Which of the following statements is true?

A The product of two elementary matrices is elementary.

B If P is invertible and $PQ = 0$ then $Q \neq 0$.

C Every invertible matrix can be factored into a product of elementary matrices.

D If P is a square matrix and the homogeneous system $P\mathbf{x} = \mathbf{0}$ has only the trivial solution, then P is singular.

E If P is a singular matrix, then the reduced row echelon form of P does not have any row of zeros.

Next Question

2. Find the inverse of

$$\begin{pmatrix} 2 & 0 & 0 \\ 0 & 4 & 3 \\ 0 & 1 & 1 \end{pmatrix}$$

.

A $\begin{pmatrix} \frac{1}{2} & 0 & 0 \\ 0 & 1 & -3 \\ 0 & -1 & 4 \end{pmatrix}$ B $\begin{pmatrix} -\frac{1}{2} & 0 & 0 \\ 0 & -1 & 3 \\ 0 & 1 & 4 \end{pmatrix}$

C $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 2 & -6 \\ 0 & -2 & 8 \end{pmatrix}$ D $\begin{pmatrix} -1 & 0 & 0 \\ 0 & -2 & 6 \\ 0 & 2 & 8 \end{pmatrix}$

E $\begin{pmatrix} \frac{1}{2} & 0 & 0 \\ 0 & -1 & 3 \\ 0 & 1 & -4 \end{pmatrix}$

Next Question

3. Find an elementary matrix E such that $ES = T$, where

$$S = \begin{pmatrix} 8 & 1 & 5 \\ -4 & -15 & -3 \\ 3 & 4 & 1 \end{pmatrix} \quad \text{and} \quad T = \begin{pmatrix} 8 & 1 & 5 \\ 2 & -7 & -1 \\ 3 & 4 & 1 \end{pmatrix}.$$

A $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & -2 \\ 0 & 0 & 1 \end{pmatrix}$ B $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 2 \\ 0 & 0 & 1 \end{pmatrix}$

C $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 2 & 1 \end{pmatrix}$ D $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & -2 & 1 \end{pmatrix}$

E $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

Next Question

4. Find the inverse of

$$\begin{pmatrix} 2 & -9 & 15 \\ 1 & -7 & 10 \\ -6 & 32 & -45 \end{pmatrix}$$

.

A $\begin{pmatrix} -0.2 & -3 & -0.6 \\ -0.6 & 0 & 0.2 \\ -0.4 & -0.4 & 0.2 \end{pmatrix}$ B $\begin{pmatrix} -0.2 & 3 & -0.6 \\ 0.6 & 0 & -0.2 \\ -0.4 & -0.4 & 0.2 \end{pmatrix}$

C $\begin{pmatrix} -0.2 & -3 & -0.6 \\ 0.6 & 0 & -0.2 \\ 0.4 & 0.4 & -0.2 \end{pmatrix}$ D $\begin{pmatrix} 0.2 & 3 & 0.6 \\ 0.6 & 0 & 0.2 \\ 0.4 & 0.4 & 0.2 \end{pmatrix}$

E $\begin{pmatrix} 0.2 & -3 & -0.6 \\ 0.6 & 0 & 0.2 \\ 0.4 & 0.4 & 0.2 \end{pmatrix}$

Next Question

5. If U is an invertible matrix and $\mathbf{b}$ is a fixed vector then the number of solutions of the system $U\mathbf{x} = \mathbf{b}$ may be

- A 0, 1, or ∞
- B 0 or 1
- C 1 or ∞
- D 1 only
- E ∞

No more questions

RIGHT!

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Wrong...try again

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