

Exercises 1.5 - 1.7

MATH 244
LINEAR ALGEBRA

Which of the following is true about elementary row operations?

- A. They are irreversible.
- B. They can be represented by multiplying by elementary matrices.
- C. They are only applicable to square matrices.

 Multiple Choice

Which of the following matrices is row equivalent to $\begin{bmatrix} 2 & 0 \\ 0 & 3 \end{bmatrix}$?

- A. $\begin{bmatrix} 1 & 0 \\ 0 & 0 \end{bmatrix}$
- B. $\begin{bmatrix} -1 & 4 \\ 0 & 5 \end{bmatrix}$
- C. $\begin{bmatrix} 0 & 0 \\ 0 & 1 \end{bmatrix}$
- D. $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$

 Multiple Choice

Which of the following is NOT an elementary matrix?

- A. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$
- B. $\begin{bmatrix} 1 & 0 \\ 3 & 1 \end{bmatrix}$
- C. $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$
- D. $\begin{bmatrix} 2 & 2 \\ 0 & 1 \end{bmatrix}$



Multiple Choice

Which of the following is NOT a property of invertible matrices?

- A. They have a unique inverse.
- B. Their RREF is the identity matrix.
- C. They are always square matrices.
- D. They are always row equivalent to a zero matrix.



Multiple Choice

If a square matrix A is invertible, then the equation $A\mathbf{x} = \mathbf{b}$ has:

- (A) No solution
- (B) Exactly one solution
- (C) Infinitely many solutions

 Multiple Choice

True or False?

All 3×3 invertible matrices are row equivalent.

A) True.

B) False.



Multiple Choice

True or False?

All 3×3 singular matrices are row equivalent.

A) True.

B) False.



Multiple Choice

If A is not invertible, which of the following is true?

- A. $Ax = 0$ has only the trivial solution.
- B. $Ax = 0$ has infinitely many solutions.
- C. A is row equivalent to the identity matrix.
- D. A can be expressed as a product of elementary matrices.

 Multiple Choice

Which of the following is true about the matrix $\begin{bmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ 1 & 1 & 1 \end{bmatrix}$?

- A. It is an elementary matrix.
- B. It is not invertible.
- C. It is not row equivalent to the identity matrix.
- D. It is a product of elementary matrices.

 Multiple Choice

Which of the following statements is equivalent to A being invertible?

- A. $Ax = 0$ has infinitely many solutions.
- B. $RREF(A)$ has a row of zeros.
- C. $Ax = b$ has exactly one solution for every b .
- D. A is not a product of elementary matrices.

 Multiple Choice

If A is an invertible matrix, then which of the following matrices must be invertible and symmetric?

A) AA^T

B) $A + A^T$

 Multiple Choice

Given a matrix A , which of the following may NOT be symmetric?

- A. $A + A^T$
- B. $A - A^T$
- C. AA^T
- D. $A^T A$

 Multiple Choice

If a square matrix is symmetric and invertible, then its inverse is:

- (A) Also symmetric
- (B) Diagonal
- (C) Lower triangular
- (D) Upper triangular



Multiple Choice

True or False?

It is impossible for a system of linear equations to have exactly two solutions.

A) True.

B) False.



Multiple Choice

True or False?

If A is a square matrix, and if the linear system $A\mathbf{x} = \mathbf{b}$ has a unique solution, then the linear system $A\mathbf{x} = \mathbf{c}$ also must have a unique solution.

A) True.

B) False.



Multiple Choice

True or False?

If A and B are row equivalent matrices, then the linear systems $A\mathbf{x} = \mathbf{0}$ and $B\mathbf{x} = \mathbf{0}$ have the same solution set.

A) True.

B) False.



Multiple Choice

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
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