A Level Maths

Topic: Solving Linear Systems Using Matrices

Instructions

Answer all questions. Show complete working. Use matrices to solve the linear systems where applicable.

Practice Questions

1. Solve the system of linear equations using matrix methods:

$$2x + 3y = 5$$

$$4x - y = 3$$

2. Solve the system of equations using matrices:

$$x + 2y + 3z = 9$$

$$2x + y + z = 8$$

$$3x - y + 2z = 7$$

3. Solve the system of equations using matrix methods:

$$3x + y - 2z = 1$$

$$2x - y + 4z = 8$$

$$x + 3y + z = 6$$

4. Solve the following system of linear equations using the inverse of the coefficient matrix:

$$x + 2y = 6$$

$$3x - y = 7$$

5. Solve the system of equations using matrix methods:

$$2x - 3y = 8$$

$$x + y = 5$$

6. Solve the system of linear equations using matrix inversion:

$$4x + 2y = 10$$

$$x - y = 3$$

7. Solve the following system of equations:

$$2x + 4y = 6$$

$$5x - 2y = 8$$

8. Solve the system of equations using the matrix method:

$$2x - 5y = 10$$

$$3x + y = 7$$

9. Solve the system of linear equations using matrix methods:

$$6x - y + 2z = 8$$

$$2x + 3y - z = 4$$

$$3x + y + z = 7$$

10. Solve the system of equations using matrices:

$$x + y + z = 6$$

$$2x + y - z = 3$$

$$3x - y + 2z = 4$$

Multiple-Choice Questions

1. If the system of equations is $3x + 2y = 10$ and $5x - 4y = 8$, what is the determinant of the coefficient matrix?

   A. 22

   B. 30

   C. 5

   D. 1

2. Which method is used to solve systems of linear equations in matrix form?

   A. Matrix multiplication

   B. Matrix inversion

   C. Gaussian elimination

   D. All of the above

3. What is the inverse of the coefficient matrix in the system of equations $2x + 3y = 8$ and $4x + 5y = 10$?

   A. $\begin{pmatrix} -5 & 3 \\ 4 & -2 \end{pmatrix}$

   B. $\begin{pmatrix} 2 & -3 \\ -4 & 5 \end{pmatrix}$

   C. $\begin{pmatrix} 5 & -3 \\ -4 & 2 \end{pmatrix}$

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

4. The matrix form of the system of equations $x + y = 4$ and $2x - y = 6$ is:

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

   B. $\begin{pmatrix} 1 & 1 \\ 2 & 1 \end{pmatrix}$

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

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

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