PRACTICE SHEET

Matrices Basics

Rows, columns, determinants — the grid of numbers behind linear algebra.

13 questions · about 20 min

1. What is a matrix?

- A A line connecting two points
- B A set of unordered elements
- C A rectangular array of numbers arranged in rows and columns
- D A single number or scalar value

2. What does the notation 'A_{23}' represent in a matrix?

- A The sum of all elements
- B The element in the 2nd row and 3rd column
- C The determinant of the matrix
- D The element in the 3rd row and 2nd column

3. If matrix A has dimensions 3×4 (3 rows and 4 columns), how many elements does it contain?

Answer: _____

4. What is an identity matrix?

- A A square matrix with 1s on the diagonal and 0s elsewhere
- B A matrix with all zeros
- C Any matrix where all elements are the same
- D A matrix that has no inverse

5. Which of the following operations are valid for adding two matrices?

- A The result has the same dimensions as the original matrices
- B The matrices must have the same dimensions
- C You add corresponding elements together
- D You multiply corresponding elements together
- E The matrices can have different dimensions

6. What is the name of a matrix that has the same number of rows and columns?

Answer: _____

7. When multiplying matrices A (2×3) and B (3×4), what will be the dimensions of the resulting matrix?

- A 3×3
- B The matrices cannot be multiplied
- C 2×3
- D 2×4

8. What is the transpose of a matrix?

- A A matrix with all negative values
- B The inverse of the original matrix
- C A new matrix formed by swapping rows and columns
- D A matrix with the same dimensions as the original

9. Which statements are true about matrix multiplication?

- A It is commutative: AB = BA
- B The order of matrices does not matter
- C It is associative: (AB)C = A(BC)
- D It is distributive: A(B + C) = AB + AC

10. What is a matrix with only zeros called?

Answer: _____

11. What is the determinant?

- A A scalar value calculated from a square matrix that has special properties
- B The average of all diagonal elements
- C The sum of all elements in a matrix
- D The number of rows in a matrix

12. If a matrix A is invertible, what is the relationship between A and its inverse A^{-1}?

- A $A^{-1} = A$
- B $AA^{-1} = 0$ (zero matrix)
- C $AA^{-1} = A$
- D $AA^{-1} = A^{-1}A = I$ (identity matrix)

13. Calculate the determinant of the 2×2 matrix [[3, 2], [1, 4]].

Answer: _____