**MATRICES**

This is the arrangement of objects or items in rows (horizontal) and columns (vertical)

**TYPES OF MATRICES**

1. Square

2. Diagonal

3. Scalar

4. Unit or Identity. It is usually represented with the letter I

5. Null

6. Column

7. Row

8. Upper triangle

9. Lower triangle

**TERMS USED IN MATRICES**

1. **Transpose of a matrix**: Given a matrix A, the transpose of that matrix, represented as can be obtained by interchanging rows for columns and vice versa

2. **Symmetric matrix**: A symmetric matrix is one which is the same as its transpose

3. **Singular matrix**: This is a matrix that has no determinant or the determinant is 0

**MINOR OF A MATRIX**

The minor of a matrix can be found by canceling out the row and column containing that element. The minor of a 3 by 3 matrix can also be found similarly. However, in this case, we have to deal with determinants. That is to say, we find the determinant after we have canceled out the row and column containing that element.

**CO-FACTOR OF A MATRIX**

The co-factor of a matrix can be found by

1. Finding the minor

2. Applying the sign conventions: for the sign convention, it is a minus raised to the position of the element (that is the row and column of the element)

For example, given a matrix A. When finding the co-factor the element will have a sign . That is . That will be a positive sign.

**ADJOINT OF A MATRIX**

This is the transpose of the co-factor of a matrix

**INVERSE OF A MATRIX**

Given a matrix A, the inverse of the matrix can be gotten from the formula:

Only a square matrix can have an inversely

A singular matrix is one that has a determinant of 0

A singular matrix has no inverse and its inverse is therefore undefined

If , then

**ORDER OF MATRIX**

2 order matrix: Any square matrix of order 2 will be

The determinant of A

3 order matrix

The determinant of A,

Similarly,

**PROPERTIES OF DETERMINANTS**

1. If and . Notice that the rows were changed

2. If A is an matrix and (multiplying by a scalar), then

This property can also be modified to state that n = number of rows multiplied by the scalar

3. If A and B are two matrices, Then

4. For a matrix A,

**APPLICATIONS OF MATRICES**

1. Solving linear equations (simultaneous equations)

2. Finding the area of the triangle

3. Encoding

4. Decoding

5. Mathematics puzzles

6. Games

7. Information like credit card number

8. Optics

9. Economics

QUESTIONS

1. Given that , find (the answer is a matrix)

2. If and , find

3. If , then exists only if

a. lambda /= -2

b. lambda /= 2

c. None of the above

d. lambda = -2\

e. lambda = 2

4. Given that , find

5. Evaluate

6. If and , find

7. If and , find

8. If and , find

9. If , then is given by

10. If A is a square matrix of order 3 and , then the value of is? (Finding a value) Answer is 40.

AGENDA

1. Matrices, Types

2. Determinants

3. Applications of Matrices

4. Basic Matrix Theory and Algebra

5. Systems of Linear Equations

6. Elementary Row-reduction

7. Types and Methods of Solution

8. Echelon Form

9. Introduction to systems of inequalities and linear programming