MAKERERE UNIVERSITY
MAKERERE UNIVERSITY BUSINESS SCHOOL
DEPARTMENT OF MANAGEMENT SCIENCE
LINEAR ALGEBRA TAKE HOME EXERCISE FOR
BACHELOR OF BUSINESS STATISTICS YEAR ONE OF MAKERERE UNIVERSITY
ACADEMIC YEAR: 2023/2024 SEMESTER I

Instructions

i). Do this in a group of Ten (10)
ii) Cleary indicate the names and registration numbers of the group members
iii). Clearly show your working and computations
iv). Submit your work not later than 20th October 2023. This will be a physical submission during the Linear Algebra lecture.

Question One

Suppose you want to find values for a, b and c such that the parabola $y=ax^2+bx+c$ passes through the points (1,1),(2,4) and -1,1). Find (but do not solve) a system of linear equations whose solutions provide values for a, b and c. How many solutions would you expect this system of equations to have and why?

(5 marks)

Question Two

Solve the following system for x, y and z.

$$\frac{1}{x}+\frac{2}{y}-\frac{4}{z}=1$$
$$\frac{2}{x}+\frac{3}{y}+\frac{8}{z}=0$$
$$\frac{-1}{x}+\frac{9}{y}+\frac{10}{z}=5$$

(5 marks)

Question Three

Consider the matrix

$$A=\begin{bmatrix}-2 & 0 & 1\\ -5 & 3 & a\\ 4 & -2 & -1\end{bmatrix}$$

for some variable 'a'. Find all values of 'a', which will prove that Matrix A has eigenvalues 0, 3, and −3. **(7 marks)**

Question Four

Given the following Matrices, find all eigenvalues and eigenvectors

i)

$$A = \begin{bmatrix} -2 & 1 \\ 12 & -3 \end{bmatrix}$$

(4 marks)

ii) $B = \begin{pmatrix} 1 & 0 & 1 \\ 1 & 0 & 0 \\ -2 & 2 & -1 \end{pmatrix}$ **(9 marks)**

>>>>>>>>>>>>>>>>>>>>**END**<<<<<<<<<<<<<<<<<<<<

https://www.analyzemath.com/linear-algebra/matrices/eigenvalues-and-eigenvectors-questions-with-solutions.html