



Royal University of Phnom Penh
Faculty of Sciences
Department of Mathematics

Partial Exam 1

Linear Algebra II:

Duration: 2 hours

Problem 1

Compute determinant of the following matrix

$$\begin{bmatrix} -2 & 0 & -1 & 2 & 2 \\ 3 & 1 & 1 & -1 & 3 \\ 1 & 2 & 3 & -1 & 2 \\ 0 & 1 & 2 & 1 & 2 \\ -3 & 3 & 2 & -2 & 1 \end{bmatrix}$$

Problem 2

If a $n \times n$ matrix A is orthogonal, prove that $\det A = \pm 1$.

Problem 3

Given a linear map $f : \mathbb{R}^3 \rightarrow \mathbb{R}^3$ such that

$$f(x, y, z) = (-15x - y + 13z, -8x - 4y + 8z, -19x - y + 17z)$$

Find a basis of \mathbb{R}^3 such that the matrix of f relative to such basis is a diagonal matrix.

Problem 4

For $A = \begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$, find an expression for A^n where n is an arbitrary positive integer.