

**INVERS TERGENERALISASI
MOORE-PENROSE MATRIKS SUKUBANYAK
ATAS $F[x_1, x_2, \dots, x_n]$, $Z[x_1, x_2, \dots, x_n]$ dan $\mathbb{R}[x_1, x_2, \dots, x_n]^*$**

NASKAH PUBLIKASI

Untuk memenuhi sebagian persyaratan
Mencapai Magister Sains

Program Studi Matematika
Jurusan Ilmu-ilmu Matematika
dan Pengetahuan Alam



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Kepada

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UNIVERSITAS GADJAH MADA
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1999**

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MOORE-PENROSE
GENERALIZED INVERSE OF POLYNOMIAL MATRICES
OVER $F[x_1, x_2, \dots, x_n]$, $Z[x_1, x_2, \dots, x_n]$ and $\mathbb{R}[x_1, x_2, \dots, x_n]^*$

Dian Usi **NASKAH PUBLIKASI** di MS

Program Studi Matematika

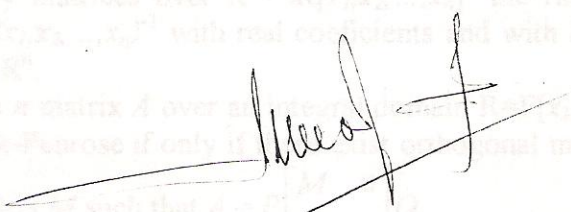
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ABST

In this thesis we discuss about necessary and sufficient condition
for Moore-Penrose generalized inverse for polynomial matrices over
the domain $R = F[x_1, x_2, \dots, x_n]$ and $Z[x_1, x_2, \dots, x_n]$. We also discussed
the dual sufficient condition for the existence of Moore-Penrose generalized
inverse for matrices over $R = \mathbb{R}(x_1, x_2, \dots, x_n)$, the ring of rational functions
in (x_1, x_2, \dots, x_n) with real coefficients and with $b(x_1, x_2, \dots, x_n) \neq 0$
in \mathbb{R}^n .

telah disetujui :

Pembimbing,



Prof. Drs. Setiadji, MS.

NIP. 130160515

Let A be an $n \times n$ matrix over the domain $R = F[x_1, x_2, \dots, x_n]$ has generalized inverse if only if there exist rational matrices $P(x_1, x_2, \dots, x_n)$ and $Q(x_1, x_2, \dots, x_n)$ such that $A = P A Q$.

Let A be an $n \times n$ matrix over the domain $R = \mathbb{R}(x_1, x_2, \dots, x_n)$, generalized inverses of A exist if and only if A can be written as $A = P A Q$ with P, Q rational matrices.

Let $A = \begin{bmatrix} A & 0 \\ 0 & 0 \end{bmatrix}$, rank $A = r$ constant over all (x_1, x_2, \dots, x_n) in \mathbb{R}^n .

I. PENDAHULUAN

**INVERS TERGENERALISASI
MOORE-PENROSE MATRIKS SUKUBANYAK
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**MOORE-PENROSE
GENERALIZED INVERSE OF POLYNOMIAL MATRICES
OVER $F[x_1, x_2, \dots, x_n]$, $Z[x_1, x_2, \dots, x_n]$ and $\mathbb{R}[x_1, x_2, \dots, x_n]^*$**

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ABSTRACT

In this thesis we discuss about necessary and sufficient condition for the existence of Moore-Penrose generalized inverse for polynomial matrices over an integral domain $R=F[x_1, x_2, \dots, x_n]$ and $Z[x_1, x_2, \dots, x_n]$. We also discussed about necessary and sufficient condition for the existence of Moore-Penrose generalized inverse for any matrices over $R = \mathbb{R}[x_1, x_2, \dots, x_n]^*$ the ring of rational functions $\frac{a(x_1, x_2, \dots, x_n)}{b(x_1, x_2, \dots, x_n)}$ with real coefficients and with $b(x_1, x_2, \dots, x_n) \neq 0$ for all (x_1, x_2, \dots, x_n) in \mathbb{R}^n .

An $m \times n$ matrix A over an integral domain $R=F[x_1, x_2, \dots, x_n]$ has generalized inverses Moore-Penrose if only if there exist orthogonal matrices $P(m \times m)$, $Q(n \times n)$ and unitair matrix M such that $A = P \begin{bmatrix} M & 0 \\ 0 & 0 \end{bmatrix} Q$.

An $m \times n$ matrix A over $R = \mathbb{R}[x_1, x_2, \dots, x_n]^*$ has generalized inverses Moore-Penrose if only if A can be written as PA_0Q ($A = PA_0Q$) with P, Q unimodular R -matrices and $A_0 = \begin{bmatrix} I_r & 0 \\ 0 & 0 \end{bmatrix}$, $\text{rank } A = r$ constant over all (x_1, x_2, \dots, x_n) in \mathbb{R}^n .

Key words : Integral domain, Moore-Penrose generalized inverse, polynomial matrices.

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