1

1.1 .

. ,a .. $x, y \in A$
$x * Y = e$

1.1.1

c x * y = e, x y
y x

1.1.2

xz = xz = r
x z $x = z^{-1}$

1.1.3

$y, z \in A$
$\exists x$ - y -
:

1. z -
2. x = y = z

1.2

K_n^n -

1.2.1

$E : \forall A \in K_n^n$
$AE = EA = A$

1.2.2

$A^{-1} : AA^{-1} = E$

1.2.3

$\exists A^{-1} \Leftrightarrow detA \neq 0$

1.2.4 A^{-1}

$[A|E] \sim [E|A^{-1}]$

$]A : \tilde{a}^i_j = A^i_j = (-1)^{i+j} M^i_j$ -
$A^{-1} = \frac{1}{detA} \tilde{A}^T$

1.3

$\varphi : X \to X$

1.3.1

φ φ^{-1}:
$\varphi^{-1}\varphi = \varphi\varphi^{-1} = I$

1.3.2

φ $\exists$

1.3.3 NB

$\tilde{A} = SAT$
$det\tilde{A} = det(SAT) = detS \cdot detA \cdot detY$

1.3.4

$\varphi : Ker\varphi = \{x \ inX : \varphi x = 0\}$

1.3.5

$Ket\varphi$ -

1.3.6

$\varphi : \Im\varphi = \{y \ inY : \exists x : \varphi(x) = y\}$

1.3.7

$\Im\varphi$ -

1.3.8 ( )

$\varphi : x \to X \Rightarrow dimKer\varphi + dim\Im\varphi = dimX$

1.3.9

$]\varphi : X \to X \Rightarrow \exists\varphi^{-1} \Leftrightarrow dim\Im\varphi = dimX \Leftrightarrow dimKer\varphi = 0$

2

2.0.1

$\{x_i\}_{i=1}^{n}$ $det[x_1, x_2, \ldots, x_n]$, : $x_1 \wedge x_2 \wedge \ldots \wedge x_n = det[x_1, x_2, \ldots, x_n] e_1 \wedge e_2 \wedge \ldots \wedge e_n$

2.0.2

$]\varphi : x \to X$ φ^{Λ_p} φ : $\varphi^{\Lambda_p}(x_1 \wedge x_2 \wedge \ldots \wedge_p) = \varphi(x_1) \wedge \varphi(x_2) \wedge \ldots \wedge \varphi(x_p)$

2.0.3

φ
$det\varphi = det[\varphi(x_1) \wedge \varphi(x_2) \wedge \ldots \wedge \varphi(x_p)] = detA_{\varphi} e_1 \wedge e_2 \wedge \ldots \wedge e_n$