

$$A \quad m \times m$$

$$B \quad m \times m$$

$$C \quad m \times m$$

$$B \cdot A =$$

$$A \cdot B = I_m$$

$$C \cdot A =$$

$$A \cdot C = I_m$$

$$C \cdot I_m = C \cdot (A \cdot B) =$$

$$(C \cdot A) \cdot B = I_m \cdot B = B$$

$$A \cdot (A^{-1}) = I_n = A^{-1} \cdot A$$

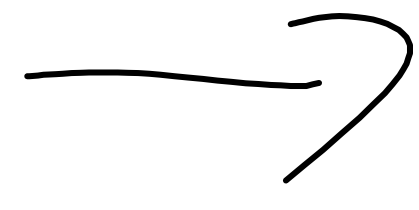
✓

$$(B^{-1} \cdot A^{-1}) (A \cdot B) = B^{-1} (A^{-1} A) B =$$

$$= B^{-1} B = I_n \quad (A \cdot B)^{-1}$$

$$(A^{-1})^T \cdot A^T = (A \cdot A^{-1})^T = \underline{\underline{I_3}}$$

$$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$$

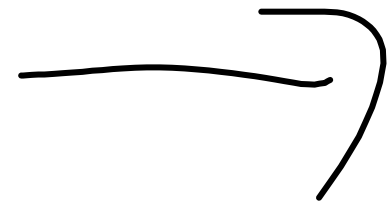


$$\begin{pmatrix} 2 & 4 \\ 3 & 4 \end{pmatrix}$$

$$E \cdot A = I$$

$$C = 2$$

$$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$



$$\begin{pmatrix} 2 & 0 \\ 0 & 1 \end{pmatrix}$$

(II)

$$\begin{pmatrix} 2 & 0 \\ 0 & 1 \end{pmatrix}$$

$$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} = I$$

$$\begin{pmatrix} 2 & 4 \\ 3 & 4 \end{pmatrix}$$

C

$$\begin{array}{c}
 A \\
 \wedge_i(A)
 \end{array}
 \xrightarrow{\quad}
 \left(
 \begin{array}{c}
 \wedge_i(A) \\
 C \wedge_i(A) \\
 \wedge_m(A) \\
 \wedge_0 \quad \wedge_0 \quad \dots \quad \wedge_0 \\
 \vdots \quad \vdots \quad C \quad \vdots \\
 \wedge_0 \quad \vdots \quad \vdots \quad \wedge_0
 \end{array}
 \right)$$

$\Pi$

$$\begin{array}{c}
 \wedge_i(A) \\
 \wedge_{i-1}(A) \\
 \underline{C \wedge_i(A)} \\
 \wedge_{i+1}(A) \\
 \vdots \\
 \wedge_m(A)
 \end{array}$$

$$\left( \begin{array}{cc|cc} 1 & 2 & 1 & 0 \\ 3 & 4 & 0 & 1 \end{array} \right) \xrightarrow{(-3)_+ R_1} \left( \begin{array}{cc|cc} 1 & 2 & 1 & 0 \\ 0 & -2 & -3 & 1 \end{array} \right) \cdot \begin{pmatrix} 1 \\ -\frac{1}{2} \end{pmatrix}$$

$$\sim \left( \begin{array}{cc|cc} 1 & 0 & -2 & 1 \\ 0 & 1 & \frac{3}{2} & -\frac{1}{2} \end{array} \right) \xrightarrow{(-2) \cdot R_2} \left( \begin{array}{cc|cc} 1 & 0 & -2 & 1 \\ 0 & 1 & \frac{3}{2} & -\frac{1}{2} \end{array} \right)$$

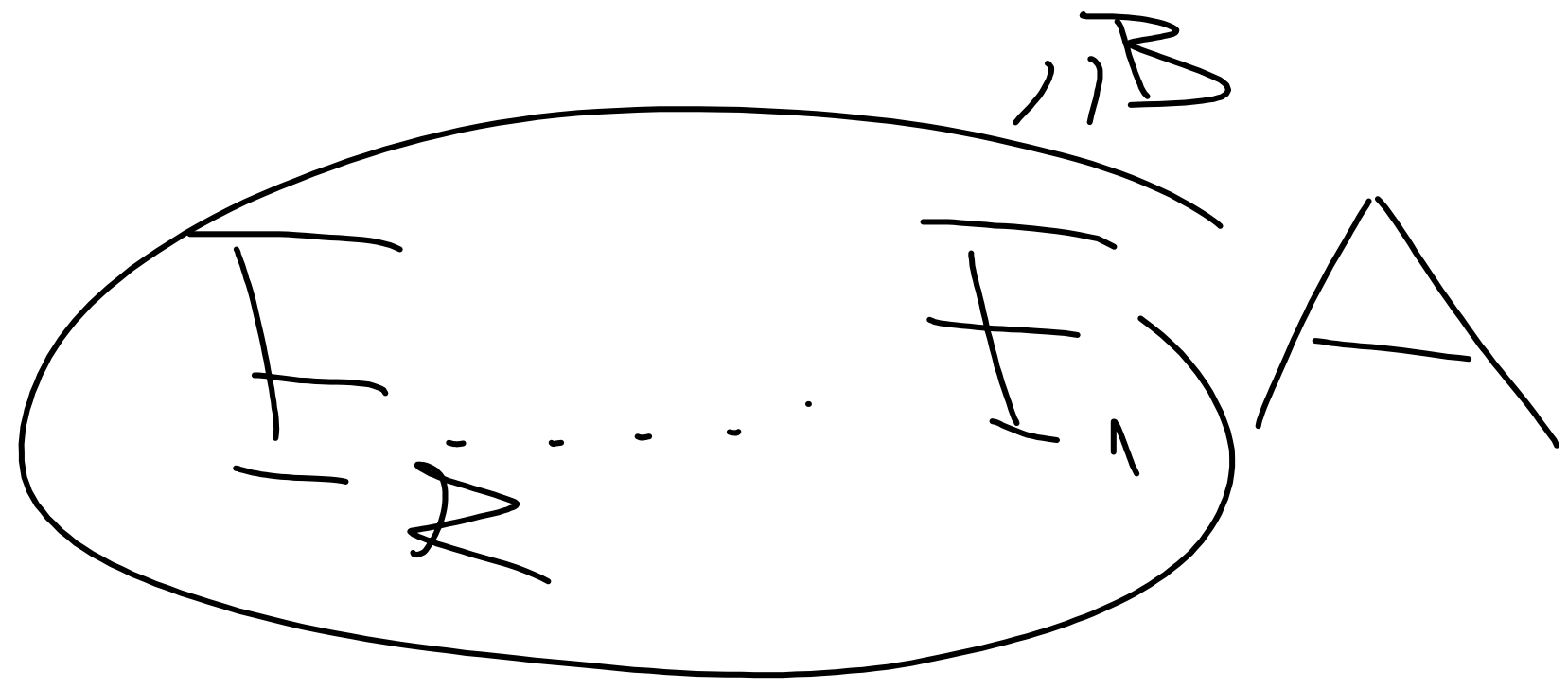
$$A \cdot B = I_m$$

$$B \cdot A = I_n$$

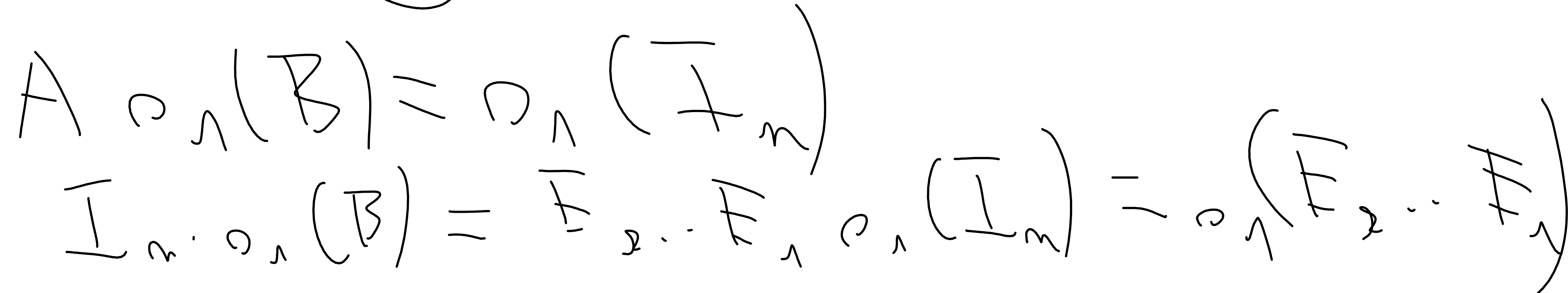
$\downarrow$   
RST

$$A \cdot C_1(B) = C_1(I_n)$$

$$\vdots$$
$$A \cdot C_m(B) = C_m(I_m)$$



$\equiv RST$





$$\begin{array}{c}
 \begin{pmatrix} 0 & \dots & 0 \\ \vdots & \ddots & \vdots \\ 0 & \dots & 0 \end{pmatrix} \\
 \Downarrow \\
 \begin{matrix}
 A & \text{is} & \text{sym} & \text{matrix} \\
 A & \parallel & \begin{pmatrix} \lambda_1 & & \\ & \ddots & \\ & & \lambda_n \end{pmatrix} & \Rightarrow \\
 & & \begin{pmatrix} \lambda_1 & & \\ & \ddots & \\ & & \lambda_n \end{pmatrix} & \Rightarrow \\
 & & \begin{pmatrix} \lambda_1 & & \\ & \ddots & \\ & & \lambda_n \end{pmatrix} & \Rightarrow \dots \Rightarrow \begin{pmatrix} \lambda_1 & & \\ & \ddots & \\ & & \lambda_n \end{pmatrix}
 \end{matrix}
 \end{array}$$

A

~ B

(H)

N

:

H

~

H

(B)

=

A

T

res.

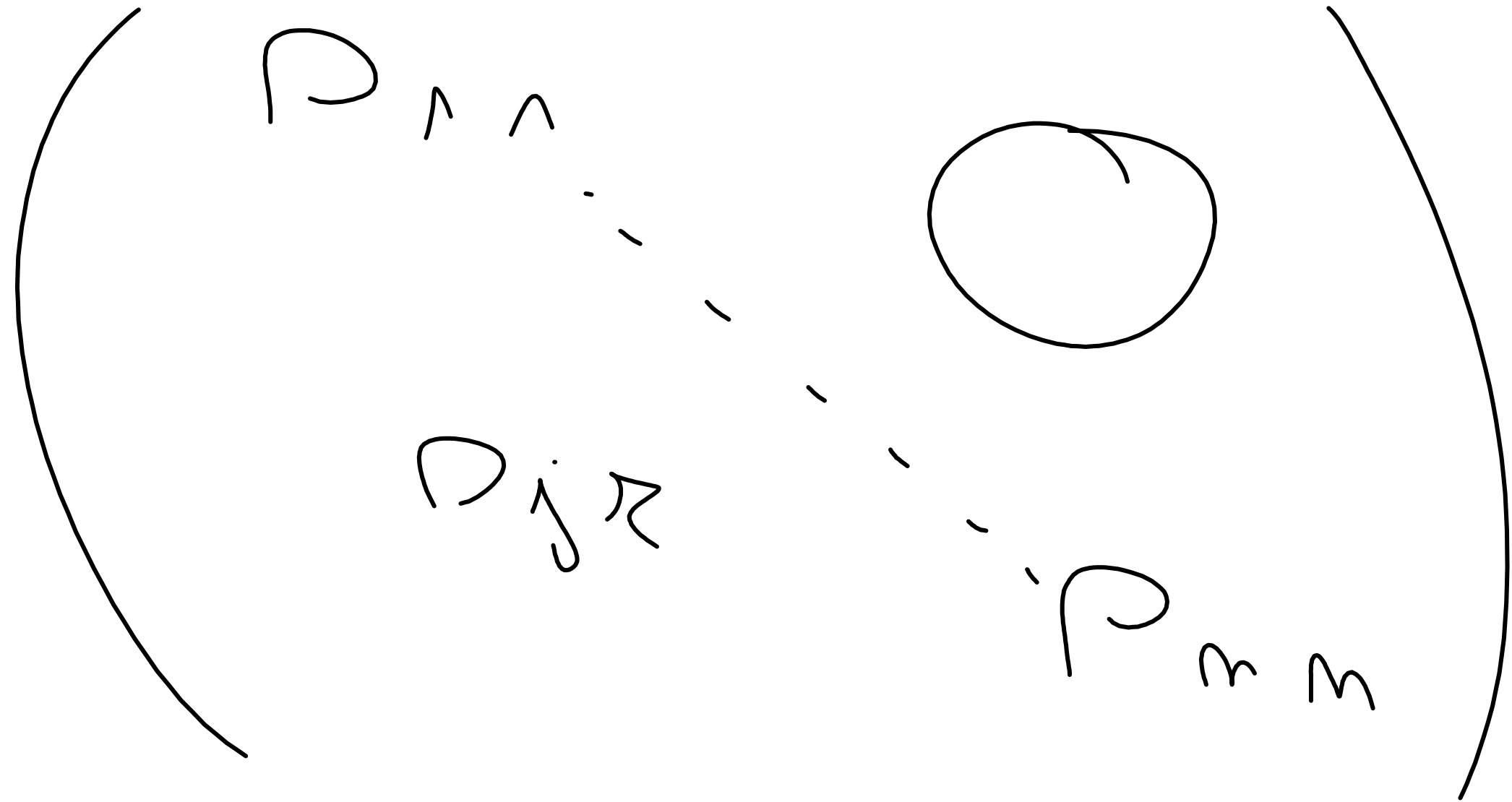


$$\frac{\wedge}{\wedge \wedge \wedge}$$

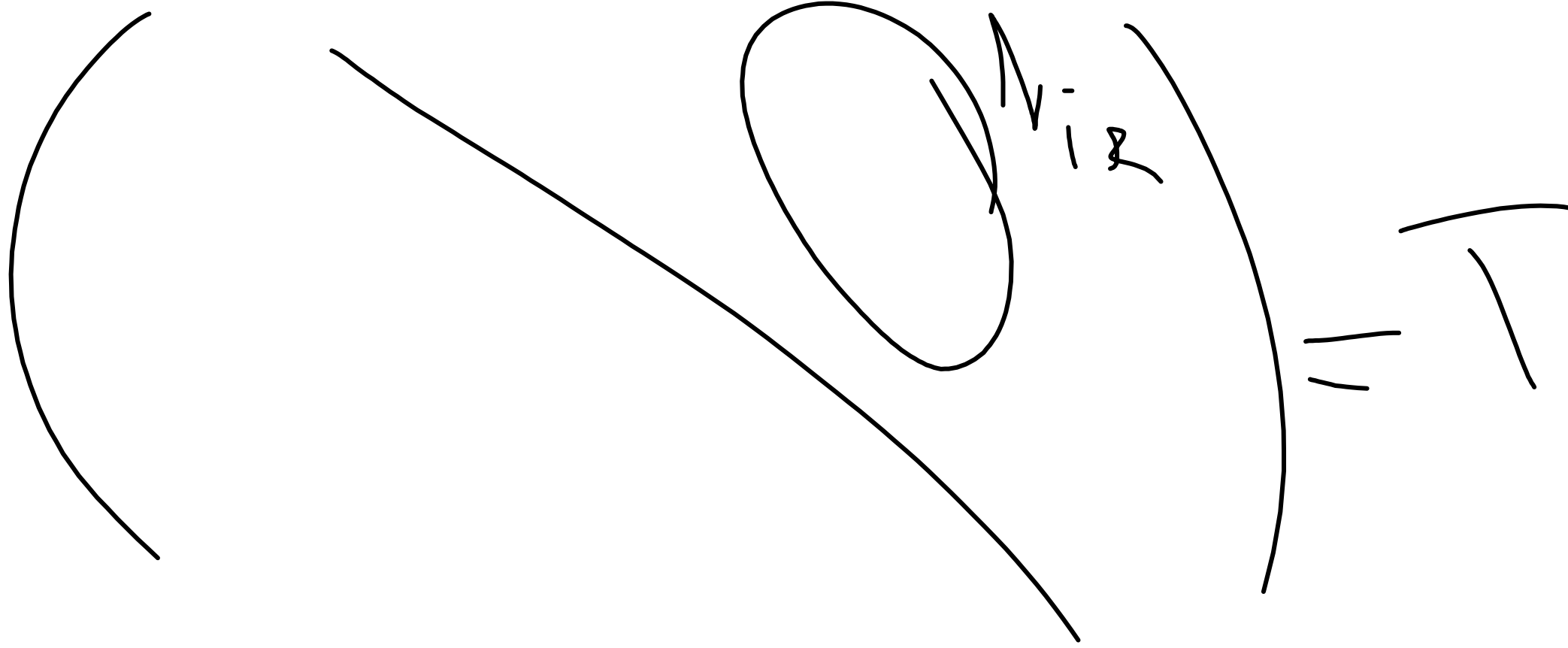


$$\left( \begin{array}{c} \wedge \\ r \wedge \wedge \\ \& \end{array} \begin{array}{c} \circ \\ \vdots \\ \circ \end{array} \right)$$

$$\left( \begin{array}{c} \wedge \\ \circ \\ -\& \end{array} \begin{array}{c} \circ \\ \vdots \\ \circ \\ \circ \end{array} \begin{array}{c} \circ \\ \wedge \end{array} \right)$$



$j < i < 2$   
 $j < 2$



$i < 2$   
 $n_{i2} = \sum_{j=1}^i n_{ij} \cdot \rho_{j2}$   
 $\rho_{j2} = 0$

$$\Lambda_{ii} = \int_{\delta_{ii}}^3$$

$$P_{ii} \sim \delta_{ii} = 0$$

$$\delta_{ii}$$

$$\delta_{ii}$$

$$\delta_{ii}$$

$$\Lambda_{ii} = 1$$

$$C_{ii} = 0$$

$$\delta_{ii}$$

$$= 0$$

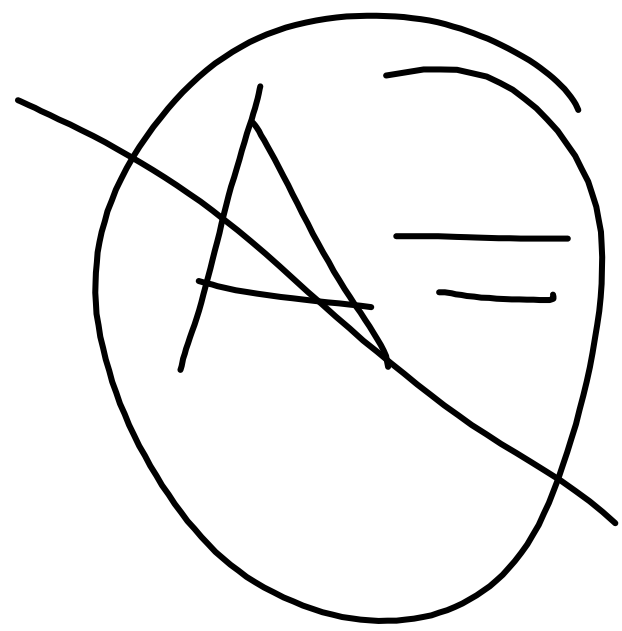
$$A \sim \dots \sim U \parallel$$

$$\left( \begin{array}{c} \neq 0 \\ \bigcirc \end{array} \right)$$

$$RA \parallel U \mid R \rightarrow$$

or

$$A \parallel R \rightarrow \text{hN} \times \text{L}$$



$$L \cup U = L' \cup U'$$

$$L' \cup U' = L'' \cup U''$$

$$(L') \cup U' = L'' \cup U''$$

$$L'' \cup U'' = L''' \cup U'''$$

$$\left( \begin{array}{c} \uparrow \\ \dots \\ \circ \\ \dots \\ \uparrow \end{array} \right) = \left( \begin{array}{c} \uparrow \\ \dots \\ \circ \\ \dots \\ \uparrow \end{array} \right)$$

$$\left( \begin{array}{c} \uparrow \\ \dots \\ \uparrow \end{array} \right)$$

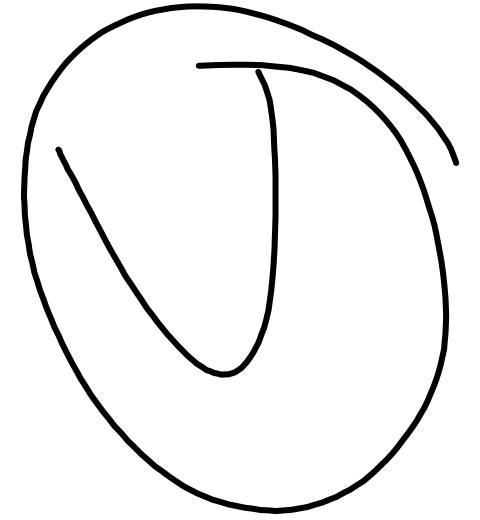


$$\left( \begin{array}{ccc|ccc} 2 & -1 & 1 & 1 & 0 & 0 \\ 4 & 1 & -1 & 0 & 1 & 0 \\ -2 & 2 & 1 & 0 & 0 & 1 \end{array} \right) \sim \left( \begin{array}{ccc|ccc} 2 & -1 & 1 & 1 & 0 & 0 \\ 0 & 3 & -3 & -2 & 1 & 0 \\ 0 & 1 & 2 & 1 & 0 & 1 \end{array} \right)$$

$$\sim \left( \begin{array}{ccc|ccc} 2 & -1 & 1 & 1 & 0 & 0 \\ 0 & 3 & -3 & -2 & 1 & 0 \\ 0 & 1 & 2 & 1 & 0 & 1 \end{array} \right)$$

$\begin{matrix} \text{N} \\ \text{N} \\ \text{N} \end{matrix}$

$\begin{matrix} R \\ A \\ = \end{matrix}$



$$\begin{array}{c}
 \begin{pmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ 0 & 1 & 1 \end{pmatrix} \xrightarrow{W157} \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \xrightarrow{W158} \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \xrightarrow{W159} \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \\
 \sim \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \xrightarrow{W160} \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \xrightarrow{W161} \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}
 \end{array}$$
  

$$\begin{array}{c}
 2 \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \xrightarrow{W162} \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ -1 & \frac{1}{3} & 1 \end{pmatrix} \xrightarrow{W163} \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}
 \end{array}$$