

$$5 \cdot \underline{1} = 5 = \underline{1} \cdot 5$$

$$\underline{1} = 5 \cdot \frac{1}{5}$$

$$-2 \left(-\frac{1}{2}\right) = \underline{1} = \left(\frac{1}{2}\right) \cdot (-2)$$

$$\underline{0} \cdot \underline{\infty} = \underline{1}$$

square matrices $n \times n$

1 Identity matrix I

1×1 (1)

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

$5 \cdot \frac{1}{5}$ 3×3 $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

A A^{-1} inverse

$$A \cdot A^{-1} = I = A^{-1} \cdot A$$

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

$$A^{-1} = \begin{pmatrix} -\frac{1}{2} & \frac{3}{4} \\ \frac{1}{2} & -\frac{1}{4} \end{pmatrix}$$

$$A \cdot A^{-1} = \begin{pmatrix} -\frac{2}{2} + \frac{3}{2} = 1 & \frac{6}{4} - \frac{3}{2} = 0 \\ -\frac{4}{2} + \frac{2}{2} = 0 & \frac{12}{4} - \frac{2}{4} = 1 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$

$$A^{-1} \cdot A = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$

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

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

$$\sim \left(\begin{array}{cc|cc} 2 & 3 & 1 & 0 \\ 0 & 1 & \frac{1}{2} & -\frac{1}{4} \end{array} \right) \begin{array}{l} \text{arrow} \\ (-3) \end{array} \sim \left(\begin{array}{cc|cc} 2 & 0 & \frac{1}{2} & -\frac{3}{4} \\ 0 & 1 & \frac{1}{2} & -\frac{1}{4} \end{array} \right) \begin{array}{l} : 2 \\ \text{arrow} \end{array} \sim \left(\begin{array}{cc|cc} 1 & 0 & -\frac{1}{4} & -\frac{3}{8} \\ 0 & 1 & \frac{1}{2} & -\frac{1}{4} \end{array} \right) \begin{array}{l} \text{arrow} \\ A^{-1} \end{array}$$

$$A \quad \begin{matrix} 2. \\ + \end{matrix} \left(\begin{array}{cc|cc} 1 & 2 & 1 & 0 \\ -2 & -4 & 0 & 1 \end{array} \right) \sim \left(\begin{array}{cc|cc} 1 & 2 & 1 & 0 \\ 0 & 0 & 2 & 1 \end{array} \right)$$

no inverse ;)

Singular