

$$\mathbb{L}\mathbb{R} \triangleright \mathbb{L}\mathbb{R} = \left\{ \mathbb{L} \xrightarrow[\mathbb{R} \text{ lin}]{\mathbb{L}} \mathbb{L} \right\} = \left\{ \begin{array}{c|c} \mathbb{L} & \mathbb{L} \\ \hline \mathbb{1} & \mathbb{1} \end{array} \right\}$$

$$\mathbb{L} \triangleright \mathbb{L} = \left\{ \mathbb{L} \xrightarrow[\mathbb{C} \text{ lin}]{\mathbb{L}} \mathbb{L} \right\} = \left\{ \begin{array}{c|c} \mathbb{L} & \mathbb{L} \\ \hline -\mathbb{1} & \mathbb{1} \end{array} \right\}$$

$$\begin{array}{ccc} x + iy \in \mathbb{L} & \xrightarrow{M_i} & \mathbb{L} \ni (x + iy)i = -y + ix \\ \downarrow * & & \downarrow \asymp \\ (x:y) \in \mathbb{L}\mathbb{R} & \xrightarrow{\begin{array}{c|c} 0 & 1 \\ \hline -1 & 0 \end{array}} & \mathbb{L}\mathbb{R} \ni (-y:x) \end{array}$$

$$(x:y) M_i = (x + iy)i = xi - y = (-y:x) = (x:y) \begin{array}{c|c} 0 & 1 \\ \hline -1 & 0 \end{array}$$

$$\Rightarrow \begin{array}{c|c} \mathbb{L} & \mathbb{L} \\ \hline \mathbb{1} & \mathbb{1} \end{array} \mathbb{C} \text{ lin} \Leftrightarrow \begin{array}{c|c} \mathbb{L} & \mathbb{L} \\ \hline \mathbb{1} & \mathbb{1} \end{array} M_i = M_i \begin{array}{c|c} \mathbb{L} & \mathbb{L} \\ \hline \mathbb{1} & \mathbb{1} \end{array}$$

$$\Leftrightarrow \begin{array}{c|c} -\mathbb{1} & \mathbb{1} \\ \hline -\mathbb{1} & \mathbb{1} \end{array} = \begin{array}{c|c} \mathbb{L} & \mathbb{L} \\ \hline \mathbb{1} & \mathbb{1} \end{array} \begin{array}{c|c} 0 & 1 \\ \hline -1 & 0 \end{array} = \begin{array}{c|c} 0 & 1 \\ \hline -1 & 0 \end{array} \begin{array}{c|c} \mathbb{L} & \mathbb{L} \\ \hline \mathbb{1} & \mathbb{1} \end{array} = \begin{array}{c|c} \mathbb{1} & \mathbb{1} \\ \hline -\mathbb{1} & -\mathbb{1} \end{array} \Leftrightarrow \begin{cases} \mathbb{L} = \mathbb{1} \\ \mathbb{1} = -\mathbb{1} \end{cases}$$