

$$\begin{array}{ccc}
 \mathbf{u} & \xrightarrow{T} & T(\mathbf{u}) \\
 \downarrow \alpha & & \downarrow \alpha \\
 \alpha \mathbf{u} & \xrightarrow{T} & T(\alpha \mathbf{u}) = \alpha T(\mathbf{u})
 \end{array}$$