

$$\begin{array}{ccc}
 & \text{Hom}_R(M, N) & \\
 & \downarrow \textcolor{red}{\hspace{0.1em}} & \\
 M & \xrightarrow{\varphi} & N \\
 & \searrow f \circ \varphi & \downarrow f \\
 & & N' \\
 & \downarrow \textcolor{blue}{\hspace{0.1em}} & \\
 & \text{Hom}_R(M, N') &
 \end{array}$$