

$$\begin{array}{ccc}
 C & \text{Hom}(A, C) & \xrightarrow{\eta_C} \text{Hom}(B, C) \\
 \downarrow f & \downarrow f \circ (-) & \downarrow f \circ (-) \\
 D & \text{Hom}(A, D) & \xrightarrow{\eta_D} \text{Hom}(B, D)
 \end{array}
 \qquad
 \begin{array}{ccc}
 k : A \longrightarrow C & \longmapsto & \eta_C(k) : B \longrightarrow C \\
 \downarrow & & \downarrow \\
 f \circ k : A \longrightarrow D & \longmapsto & \eta_D(f \circ k) = f \circ \eta_C(k).
 \end{array}$$