

$$\begin{array}{ccc}
 R & \text{Hom}_{\mathcal{C}}(R, R) & \xrightarrow{\eta_R} & K(R) \\
 \downarrow f & \downarrow f \circ (-) & & \downarrow K(f) \\
 C & \text{Hom}_{\mathcal{C}}(R, C) & \xrightarrow{\eta_C} & K(C)
 \end{array}
 \qquad
 \begin{array}{ccc}
 1_A & \longmapsto & \eta_R(1_R) = u \\
 \downarrow & & \downarrow \\
 f & \longmapsto & \eta_C(f) = K(f)(u)
 \end{array}$$