

$$\begin{array}{ccc}
 \text{Hom}_{\mathbf{C}}(X; Y) \otimes \text{Hom}_{\mathbf{C}}(Y; Y) & \xrightarrow{m_{X, Y, Y}} & \text{Hom}_{\mathbf{C}}(X; Y) \\
 \uparrow \text{id}_{\text{Hom}_{\mathbf{C}}(X; Y)} \otimes j_Y & \nearrow \text{ru} & \nwarrow \text{lu} \\
 \text{Hom}_{\mathbf{C}}(X; Y) \otimes 1 & & 1 \otimes \text{Hom}_{\mathbf{C}}(X; Y) \\
 & & \uparrow j_X \otimes \text{id}_{\text{Hom}_{\mathbf{C}}(X; Y)}
 \end{array}$$

$m_{X, Y, Y}$  is the multiplication map for the monoid  $(\text{Hom}_{\mathbf{C}}(Y; Y), \circ)$ .  
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 $j_Y$  is the right unit isomorphism for the monoid  $(\text{Hom}_{\mathbf{C}}(Y; Y), \circ)$ .  
 $j_X$  is the right unit isomorphism for the monoid  $(\text{Hom}_{\mathbf{C}}(X; X), \circ)$ .  
 $\text{ru}$  (right unit) and  $\text{lu}$  (left unit) are the unit laws of the monoid  $(\text{Hom}_{\mathbf{C}}(X; Y), \circ)$ .