$$\begin{array}{ccc}
\mathrm{Hom}_{\mathbf{C}}\left(X;Y\right) \otimes \mathrm{Hom}_{\mathbf{C}}\left(Y;Z\right) & \xrightarrow{\;\;m_{X,Y,Z}\;\;} & \mathrm{Hom}_{\mathbf{C}}\left(X;Z\right) \\
{\scriptstyle F_{X,Y}\,\otimes\,F_{Y,Z}}\Big\downarrow & & \Big\downarrow{\scriptstyle F_{X,Z}} \\
\mathrm{Hom}_{\mathbf{D}}\left(F(Y);F(Z)\right) \otimes \mathrm{Hom}_{\mathbf{D}}\left(F(X);F(Y)\right) & \xrightarrow[\;m_{F(X),F(Y),F(Z)}\;]{} & \mathrm{Hom}_{\mathbf{D}}\left(F(X);F(Z)\right)
\end{array}$$