

$$\begin{array}{ccc}
 X & \xrightarrow{i_X} & U(F(X)) \\
 & \searrow \varphi(f) & \downarrow U(f) \\
 & & U(M)
 \end{array}$$

$$\begin{array}{ccc}
 F(U(M)) & \xrightarrow{\varepsilon_M} & M \\
 \uparrow F(g) & \nearrow \varphi^{-1}(g) & \\
 F(X) & & 
 \end{array}$$