

\mathcal{C}

$$\begin{array}{ccccc} 1_A & & 1_B & & 1_C \\ \downarrow & & \downarrow & & \downarrow \\ A & \xrightarrow{f} & B & \xrightarrow{g} & C \\ & \searrow & & \nearrow & \\ & g \circ f & & & \end{array}$$

$$\downarrow F$$

 \mathcal{D}

$$\begin{array}{ccccc} 1_{F(A)} & & 1_{F(B)} & & 1_{F(C)} \\ \downarrow & & \downarrow & & \downarrow \\ F(A) & \xrightarrow{F(f)} & F(B) & \xrightarrow{F(g)} & F(C) \\ & \searrow & & \nearrow & \\ & F(g \circ f) & & & \end{array}$$