

$$\begin{array}{ccccc}
 (A, B) & \xleftarrow{u} & \Delta(A \times B) & & (A, B) & \xleftarrow{(\pi_A, \pi_B)} & (A \times B, A \times B) & & A \times B \\
 & \nwarrow h & \uparrow \Delta(f') & = & & \nwarrow h & \uparrow (f', f') & & \uparrow f' \\
 & & \Delta(C) & & & & (C, C) & & C
 \end{array}$$