

$$\begin{array}{ccc}
 & Z & \\
 f \swarrow & \downarrow h & \searrow g \\
 X & \xleftarrow{\pi_1} X \times Y \xrightarrow{\pi_2} & Y
 \end{array}
 \qquad
 \begin{array}{ccc}
 (X \times Y, X \times Y) & \xrightarrow{(\pi_1, \pi_2)} & (X, Y) \\
 \uparrow (h, h) & \nearrow (f, g) & \\
 (Z, Z) & &
 \end{array}$$