

$$\begin{array}{ccc}
 Y & \overset{\exists! f}{\dashrightarrow} & P \\
 & \searrow \forall f_i & \downarrow \pi_i \\
 & & X_i
 \end{array}$$

$$\begin{array}{ccc}
 Y & \xrightarrow{\exists! f} & P \\
 & \searrow \forall f_i & \downarrow \pi_i \\
 & & X_i
 \end{array}$$

$$\begin{array}{ccc}
 Y & \overset{\exists! f}{\dashleftarrow} & S \\
 & \nwarrow \forall f_i & \uparrow \iota_i \\
 & & X_i
 \end{array}$$