

$$\begin{array}{ccccc}
\mathrm{hom}(A, X) & \longleftarrow h_A & \longrightarrow X & \longleftarrow h^A & \longrightarrow \mathrm{hom}(X, A) \\
\downarrow & & \downarrow & & \uparrow \\
h_A(f) = f \circ - & & f & & h^A(f) = - \circ f \\
\downarrow & & \downarrow & & \downarrow \\
\mathrm{hom}(A, Y) & \longleftarrow h_A & \longrightarrow Y & \longleftarrow h^A & \longrightarrow \mathrm{hom}(Y, A)
\end{array}$$