Topic 1: Translating

Write the following arguments in symbolic form using $p, q, r, \sim, \wedge, \vee, \longrightarrow, \longleftrightarrow$, where p, q, and r are the given statements.

$$
\begin{array}{ll}
p & \text{is "birds can fly "} \\
q & \text{is "horses can run"} \\
r & \text{is "fish can swim"}
\end{array}
$$

1. Horses can run if and only if either birds cannot fly or fish can swim.

2. If birds can fly and horses cannot run, then fish cannot swim.

3. If it is not the case that either fish can swim or horses can run, then birds can fly.