# Logical Reasoning

## Reasoning

let $p$ be the statement "room 1 contains a car"

let $q$ be the statement "room 2 contains a goat"

$$\not(p \vee q)$$
$$p \text{Hypothesis}$$
$$\equiv \neg p \wedge \neg q$$

**Example 2:** Show that the following argument is valid using the rules of inference.

$$\exists x(P(x) \wedge \neg R(x))$$
$$\forall x(P(x) \rightarrow S(x))$$
$$\forall x(\neg S(x) \rightarrow R(x))$$
$$\exists x(\neg R(x) \wedge S(x))$$